



APPROVED CAPITAL IMPROVEMENTS PROGRAM

Fiscal Years 2018-27



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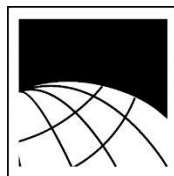
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Prince William County Public Schools

Capital Improvements Program Fiscal Years 2018-27

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CAPITAL IMPROVEMENTS PROGRAM

Overview - Fiscal Years 2018-27

Prince William County Schools (PWCS) is the second largest of 132 school divisions in the Commonwealth of Virginia and the 35th largest school division in the country. The School Division provides services to almost seven percent of the state's student enrollment.

The total 2016-17 enrollment is 88,920 students with permanent capacity for 86,916 students. This capacity is supplemented with 211 instructional portable classrooms. Capital needs are determined through the development of the Capital Improvements Program (CIP) which is annually updated to maintain a ten-year projection of the School Division's capital needs based upon student population growth and needed school building renovations and renewals. Permanent capacity is set to increase by 17,313 seats over the next ten years with completion of new school facility construction identified within this CIP.

PWCS is organized to focus on meeting the needs of its students and employees while managing 95 schools, along with administrative and support facilities. The CIP is a management tool for planning the capital improvement projects needed to house these students and employees adequately.

Since it is difficult, if not impossible, to address all county and School Division needs in a single year, a long-term approach to balance expenditures with anticipated revenues must occur. Therefore, the CIP is an ongoing plan designed to address the need for construction of new school facilities, classroom additions to existing schools, site acquisition, renewals of existing facilities, and upgrading and maintaining the School Division's infrastructure. The CIP is a blueprint of work to be performed over the next ten-year period as determined in assessments of building needs, capacity, and utilization.

Faced with continuing growth in enrollment, the CIP enables the School Division to address the changing enrollment patterns and utilize facilities in ways that are consistent with world-class educational programs. As the CIP is reviewed and updated on an annual basis, long range plans are adjusted based on enrollment projections and fiscal limitations (debt service and budget constraints.)

The CIP addresses the need for new schools and/or additions, as well as renovations, to existing school facilities, providing general guidance for the next ten years. It is not an inventory of all the work that must be performed on school facilities over the next ten years. It is, rather, a specific budget for the first year of the program (FY 2018) combined with a more general planning schedule for four additional years (FY 2019-22) and then an estimate of projects needed for FY 2023-27.

The projects designated for the first two years of the plan are the highest priority needs. Working cooperatively, the School Board and the Board of County Supervisors develop and implement a budget plan to address these needs.

Strategic Plan

The Prince William County Schools' Strategic Plan provides administrators and School Board members a vehicle to measure progress. All schools and departments are aligned with the same goals, objectives, and measures. With the comprehensive strategic plan as a road-map, it allows PWCS to focus on critical areas.

The CIP must meet the following goal and objective of the Strategic Plan:

GOAL 2: *The teaching, learning, and working environment is safe, caring, healthy, and values human diversity.*

Objective 2.3: *Enhance the appearance, condition, and capacity of physical plants, facilities, and instructional equipment.*

2.3.1 *All School Division facilities will pass compliance audits and meet building code regulations.*

This objective is addressed in two general program areas:

- New Construction - projects under construction and planned construction projects to include additions
- Renovations/Renewals/Maintenance - managing existing school building conditions

Recent Accomplishments

In the past five years, seven new schools and 16 additions have been constructed, costing nearly \$431 million and adding 10,360 student seats. The new schools included three elementary schools, one middle school, one high school, the PACE West replacement and the K-8 school. The 54,323 square-foot maintenance facility was completed at the Independent Hill complex.

The new Kyle Wilson Elementary School opened in September 2016, adding 924 student elementary seats in eastern Prince William County. Colgan High School also opened in September 2016 and added 2,053 student high school seats. The addition at Rippon Middle School was completed and opened in September 2016, adding eight classrooms.

Major renewals of 14 schools were completed in the last five years at a cost of almost \$122 million. The renewals included Title IX improvements and energy infrastructure improvements.

Nursing suites and secure entrances have been added to schools with renovations. Plus activity rooms have now been added to all elementary schools that received renewals prior to implementation of adding the activity room as part of renewal.

Additionally, the School Division continues to assess and improve school safety, including multi-million dollar enhancements in new school design and upgrades to existing buildings by providing controlled access entryways.

Planning

Planning for capital improvements is an ongoing process to meet critical system-wide capacity demands associated with current and projected enrollment growth. Priorities shift as conditions change at individual facilities, as programs change, and as the student population totals change. The official student enrollment count for Prince William County Public Schools, as of September 30, 2016, is 88,920 students. From 2015 to 2016, total enrollment grew by 1,667 students, or 1.9 percent growth rate. This is compared to growth from 2014 to 2015 of 1,045 students, or 1.2 percent.

Predicting future enrollment is important for long-range planning, budgeting, staffing, and predicting future building and capital needs. The forecasting methodology used to predict the number of students who will be enrolling in PWCS for the next 10 years is a combination of cohort progression method and student generation factors method, along with judgmental adjustment to fine-tune the forecasts. This combination of methods provides for very accurate forecasts and at the same time is relatively inexpensive to produce.

2017-18 enrollment is projected to be 90,636 students, an increase of 1,716 students overall. Examining student enrollment growth within school attendance areas, “Geographic Areas,” and school program capacities, guides the identification of the need for additional space for students. Possible solutions to overcrowding conditions include portable classrooms, relocation of special programs, changes in attendance area boundaries, additions, and the construction of new facilities.

Student enrollment projections are utilized for a variety of planning and decision-making functions, among which operational and capital budgeting needs are most prominent. The functional objective of the Student Housing program is to ensure the accurate preparation of information to enable decision-making with respect to the housing of Prince William County students. Individual school forecasts provide a snapshot of the anticipated changes that Prince William County Schools will encounter in the course of the current planning period.

Annually, the status of student housing is assessed for the next ten (10) years. This assessment includes determining the current availability of space for students, assessing current student enrollment, projecting future student enrollment, and preparing recommendations for current and future housing of students. During the next five years, student enrollment is projected to increase by an average annual rate of about 1.8 percent. This will result in about 8,496 additional students during this period. Building new school facilities and additions to existing school facilities addresses the overwhelming need for additional classrooms; where possible, additions are utilized as cost-effective alternatives to the construction of new facilities.

Program Capacity vs. Planning Capacity

The *Planning Capacity* of a school facility provides an estimate of the number of students who can be housed in a school based on averaged educational program need and staffing. The capacity for middle and high schools remains as Planning Capacity.

The *Program Capacity* of a school facility provides an estimate of the number of students who can be housed in a school based on the specific educational program currently utilized at the school facility. It is a more accurate and representative means of calculating an elementary school facility’s capacity, based on the actual “program” in place at the school. It is a calculation of current programs housed at a specific elementary school, including the effect of K-3 Class Size Reduction Grant (based on three-year average of free lunch eligibility percentage), special education program needs, gifted education program needs, and Pre-kindergarten program needs.

The 2016 enrollment capacities and projections are utilizing the Program Capacity figures at the elementary level for the CIP and boundary planning and will be updated annually to recalculate program capacities.

School Facility Totals

<i>School Type</i>	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Elementary Schools	55	55	57	57	57	57	58	59
Combined Schools	2	2	2	2	2	3	3	3
Middle Schools	15	15	15	16	16	16	16	16
High Schools	10	10	11	11	11	11	11	12
<i>Total (Regular Education)</i>	82	82	85	86	86	87	88	90
Special Education	4	3	3	3	3	3	3	3
Alternative Education	2	2	2	2	2	2	2	2
Total	88	87	90	91	91	92	93	95

The School Division is currently constructing the Independence Non-Traditional School to replace the current facilities now housing the students at Independent Hill School, PACE East, New Dominion, and New Directions. The plan is to move the PACE East students into the Independence Non-Traditional School in January 2018 and New Dominion and New Direction students into the new facility in the summer of 2018. The Independent Hill students have shifted to appropriate elementary, middle, and high schools allowing the students of Independent Hill School to be educated in the least restrictive environment.

Major Changes

Major changes from the 2017-26 CIP include:

- Eastern Area Intake/ELL Relocation from Ann Ludwig added to 2018
- Site Acquisition Funds for 15th High School added to 2019
- Minnieville Elementary School Addition (10 rooms) added to 2019
- Elementary School (Stonewall/Yorkshire) 2022 changed to Yorkshire Area
- Elementary School Occoquan/Woodbridge Area added to 2023
- Elementary School Stonewall Area added to 2024
- 15th High School (TBD) added to 2025
- KLC Addition/Renewal added to 2027
- Added Middle School Music Rooms (TBD) to be reviewed

Removed from CIP:

- Elementary School at Vint Hill Road 2024
- Elementary Addition Haymarket Area (6 Rooms) 2025

Funding

This CIP is presented by the Superintendent as part of the annual budget and reviewed and adopted by the Prince William County School Board after a public hearing. The CIP is then presented to the Prince William Board of County Supervisors as part of the School Division's budget for funding appropriation. Once the budget is adopted by the Board of County Supervisors, it becomes the basis for the CIP during the fiscal year.

Prioritizing the work within the available funding to address the most critical needs is an ever-present challenge. Funds are included in the approved budget to support the CIP. The funding formula developed by the Associate Superintendent for Finance and Support Services provides targets for construction and maintenance expenditures.

It is impossible to address all School Division needs in a single year; therefore, a long-term approach is needed to balance expenditures with anticipated revenues. Funding for long-range plans is adjusted for Prince William County's overall bonding capacity to maintain a Triple A bond rating, as directed by the Prince William Board of County Supervisors.

Funds from "Proffered," monetary contributions have also provided revenue. Proffers are residential rezoning applicant's monetary or in-kind contribution to the School Division to help mitigate the capital costs associated with residential development.

Proffer Changes

As of July 1, 2016, the Virginia General Assembly passed SB 549, which amends the Virginia Code relating to conditional zoning for residential rezonings and proffer amendments. Prince William County's Policy Guide for Monetary Contributions could be determined to be inconsistent with SB 549, therefore, the Board of County Supervisors repealed the residential portion of the Policy Guide for Monetary Contributions effective July 1, 2016.

All residential rezoning applications accepted after July 1, 2016 must provide methodology and justification for all proffers proposed for residential rezoning. Proposed proffers need to address an impact that is specifically attributable to a proposed new residential development.

Each new residential development rezoning submitted after July 1, 2016 must address an impact to an off-site public facility such that:

- the new residential development creates a need for one or more public facility improvements in excess of existing public facility capacity at the time of the rezoning and,
- new residential development receives a direct and material benefit from a proffer made with response to any such public facility improvement.

The School Division will no longer be receiving monetary contributions based on the number and type of residential units to be constructed. The School Division will still collect monetary contributions on rezonings filed prior to July 1, 2016.

New Schools, Additions, and Other Bond-Funded Projects

<i>Scheduled Completion</i>	<i>Project</i>	<i>Cost</i>
<i>September 2017</i>	Covington-Harper Elementary School	<i>Previously Funded/Under Construction</i>
	Kilby Elementary School Replacement	
	Belmont Elementary Addition (10 rooms)	
	Henderson Elementary School Addition (10 rooms)	
	Neabsco Elementary School Addition (8 rooms)	
	Site Acquisition Funds - Elementary School	
	Site Acquisition Funds - 13th High School	
	Antietam Elementary School - Renewal	
	McAuliffe Elementary School - Renewal	
	Mullen Elementary School - Renewal	
	Westridge Elementary School - Renewal	
	Lake Ridge Middle School - Renewal	
	Saunders Middle School - Renewal	
	Total 2017	
<i>September 2018</i>	Pattie Elementary School Addition (10 rooms) - Consolidation / Building Renovation @ Washington-Reid	\$12,200,000
	Lake Ridge Middle School Addition (13 rooms)	\$12,937,000
	Independence Non-Traditional School	\$35,850,000
	Eastern Area Intake/ELL Relocation from Ann Ludwig ²	\$2,000,000
	River Oaks Elementary School - Renewal (Funding Phase 1)	\$6,000,000
	Westridge Elementary School - Renewal (Funding Phase 2B)	\$98,000
	Lake Ridge Middle School - Renewal (Funding Phase 2)	\$2,600,000
	Saunders Middle School - Renewal (Funding Phase 2)	\$2,600,000
	Site Acquisition Funds - 14th High School	\$14,000,000
	Total 2018	\$88,285,000

New Schools, Additions, and Other Bond-Funded Projects

<i>Scheduled Completion</i>	<i>Project</i>	<i>Cost</i>
<i>September 2019</i>	PW Parkway Elementary School	\$32,686,000
	Antietam Elementary School Addition (13 rooms)	\$10,384,000
	Lake Ridge Elementary School Addition (13 rooms)	\$10,884,000
	Springwoods Elementary School Addition (13 rooms)	\$11,884,000
	Leesylvania Elementary School Addition (4 rooms)	\$6,900,000
	Minnieville Elementary School Addition (10 rooms)	\$12,043,000
	Stonewall Middle School Addition (17 rooms)	\$17,132,000
	Special Needs Transportation Center @ New Dominion	\$2,000,000
	Western Transportation Facility	\$12,500,000
	Site Acquisition Funds - 15 th High School	\$15,000,000
	Renewal of Various Schools (Bond-Funded portion)	\$11,631,100
	Total 2019	\$143,044,100
<i>September 2020</i>	Middle School at Potomac Shores	\$67,328,000
	Renewal of Various Schools (Bond-Funded portion)	\$10,352,100
	Total 2020	\$77,680,100
<i>September 2021</i>	Elementary School (Cherry Hill Area) ¹	\$35,383,000
	13th High School (West) (2,557 capacity)	\$133,400,000
	Renewal of Various Schools (Bond-Funded portion)	\$27,658,300
	Total 2021	\$196,441,300
<i>September 2022</i>	Elementary School (Yorkshire Area) ¹	\$37,156,000
	Total 2022	\$37,156,000
<i>September 2023</i>	Elementary School (Occoquan/Woodbridge Area) ¹	\$39,018,000
	14th High School (Mid-County) ¹ (2,557 capacity)	\$143,442,000
	Renewal of Various Schools (Bond-Funded portion)	\$21,207,000
	Total 2023	\$203,667,000
<i>September 2024</i>	Elementary School (Stonewall Area) ¹	\$40,973,000
	Middle School (West - Linton Hall Area)	\$74,238,000
	Renewal of Various Schools (Bond-Funded portion)	\$25,000,000
	Total 2024	\$140,211,000

New Schools, Additions, and Other Bond-Funded Project

Scheduled Completion	Project	Cost
<i>September 2025</i>	15 th High School (TBD) ¹ (2,557 capacity)	\$151,787,000
	Renewal of Various Schools (Bond-Funded portion)	\$25,000,000
	Total 2025	\$176,787,000
<i>September 2026</i>	Middle School (TBD) ¹	\$81,855,000
	Renewal of Various Schools (Bond-Funded portion)	\$25,000,000
	Total 2026	\$106,855,000
<i>September 2027</i>	KLC Addition/Renewal (Admin Space Addition)	\$18,000,000
	Renewal of Various Schools (Bond-Funded portion)	\$25,000,000
	Total 2027	\$43,000,000
<i>New Schools, Additions, and Other Projects TOTAL</i>		\$1,213,126,500

Note 1 - Sites needed by proffer or purchase (Current CIP includes limited site acquisition funds)

Note 2 - Eastern Area Intake Relocation

Summer 2018 - Relocate Eastern Area Intake/ELL staff from Ann Ludwig

Site Acquisition

Land acquisition for school sites is challenging as prime undeveloped land is purchased or optioned by developers for high-profit future residential, commercial, and industrial development. Real estate costs continue to escalate, therefore PWCS must look further into the future and acquire sites now or pay higher premiums later.

School staff reviews county residential development plans and maintains a database containing the number of anticipated housing units and the stage of development. This information is used in making enrollment projections. The projected enrollments by geographic area determine future school locations and attendance areas. School sites acquired must be located and sized in accordance with the adopted Prince William County Comprehensive Plan.

Potential school sites are evaluated and should satisfy the following criteria:

- Located proximate to geographic location of projected student population to be served
- Access to transportation network
- Educational program requirements
- Availability of utilities
- State and local size requirements
- Soil and topographic conditions
- Grading and drainage conditions

Land acquisition will continue to figure prominently in this and future capital improvement budgets. Funding for school site acquisition comes from a combination of rezoning “proffered” funds or sites, bond funds, and the operating budget. “Proffered” funds contributions to the School Division have helped to offset the impact of new residential development on schools. As of July 1, 2016 though, the Board of County Supervisors repealed the residential portion of the Policy Guide for Monetary Contributions. However, monetary contributions on rezonings filed prior to July 1, 2016 will still be collected by the School Division.

In 1990, as part of the Comprehensive Plan, Prince William County established level of service (LOS) criteria as a standard or bench-mark to measure the quantity and/or quality of service provided by a government agency. The LOS standards provide an objective justification for mitigation requests.

Sixteen school sites have been acquired by proffers since 2000, with an estimated value of \$63,800,000. The School Division purchased 10 school sites and facilities since 2000, spending approximately \$43,295,000. Site acquisition funding for the 13th, 14th, and 15th high schools and an elementary school are included in PWCS Advertised Budget via bond funding.

The 16.7 acre Western Transportation Facility was acquired in 2016. Purchase prices have been negotiated for the PW Parkway Elementary School site and the 13th High School site, with final settlement proposed for 2017.

Even with purchased and proffered sites, there are still seven school sites needed by 2027. If previously proffered school sites are not used, an additional middle school site will need to be acquired.

The location, character, and extent of all proposed public facilities must be consistent with Prince William County’s Comprehensive Plan as determined by the Prince William County Planning Commission and the Prince William Board of County Supervisors.

School Site Needs - Planned

<i>Year to Open</i>	<i>Year to Acquire</i>	<i>Planned School Facility</i>	<i>Property Status</i>	<i>Estimated Funds Required</i>	<i>Funding Source</i>
2019	2017	PW Parkway ES	Purchase Price negotiated with Owner	\$7,800,000	BOCS
2021	2018	ES (Cherry Hill Area)	Site Needed	\$5,000,000	N/A
	2017	13 th High School (2,557 capacity)	Purchase Price negotiated with Owner	\$16,000,000	
2022	2019	ES (Yorkshire Area)	Site Needed	\$5,000,000	
2023	2017-18	14 th High School (2,557 capacity)	Site Needed	\$14,000,000	Bond
	2019	ES (Occoquan/Woodbridge Area)	Site Needed	\$6,000,000	
2024	2020	ES (Stonewall Area)	Site Needed	\$6,000,000	
	2019	MS West (Linton Hall Area)	Proffered-Avendale	\$0	
			Otherwise Site Needed	\$7,200,000	
2025	2019-20	15 th High School (2,557 capacity)	Site Needed	\$15,000,000	Bond
2026	2022	MS (TBD)	Site Needed	\$7,500,000	
<i>Total Estimated Cost of School Site Needs</i>				\$89,500,000	

Renovations/Renewals

New construction projects are only part of the CIP picture. Renovations/renewals are programmed to assure that all schools are safe, functional, and provide the facilities necessary to support the current educational programs regardless of the age of the building. School renewals are infrastructure improvements that are important to improve capacity, provide adequate activity spaces, and to meet current instructional needs such as technology and music.

Fifty-three of the Division's 95 school facilities are 25 years or older. The goal of the school renewal program is to renovate schools prior to 25 years of age since the last renewal. The older buildings are well-maintained but are in constant need of repair. They must be renewed to provide quality space, continuity, and stability for a *World-Class Education*. The projects contained in this plan are based on the planning, design review, and input from a team of in-house facility maintenance professionals, administration, school principals, and facility-condition evaluations conducted by architect and engineer consultants.

The Office of Facilities Services continues to meet these challenges head-on and to make dramatic improvements to the physical condition of schools. School building conditions are assessed annually and consideration of critical needs and prior facility upgrades are evaluated. Recent renewals allow for changing the emphasis from systems replacements to maintenance in areas such as roofing and paving repairs.

This CIP addresses the reduction of the backlog of renewal projects at older buildings, with age of each school building the first consideration. The order of renewals may be altered when major components are addressed with previous projects, accelerated deterioration conditions warrant, and with funding constraints. The Schedule of Renovations and Renewals includes annual dollars for kitchen upgrades, energy infrastructure improvements, HVAC equipment and controls upgrades, Title IX and technology improvements, portable classroom relocations, and asphalt upgrades. The list of capital projects identified provides a clear statement of school facility requirements that have been categorized within the limitation of projected funding.

Many of the older elementary schools were lacking activity rooms and have been added with the renewals. Activity rooms have now been added to all elementary schools that received renewals prior to implementation of adding an activity room as part of renewal.

Infrastructure Task Force

As new school facilities are constructed, differences exist between the new school facilities and those previously constructed. It is important to review the features provided in new school facilities versus those available in existing schools in order to ensure consistency of educational opportunities provided within the School Division.

The School Board has established an Infrastructure Task Force to examine, evaluate, recommend, and prioritize a long-term plan for resolving facility inequities amongst school facilities. The Task Force is charged with providing the School Board:

- an assessment of the spectrum of differences between the older schools and the new ones
- recommended list of improvements that would bring the older schools up to par, as much as practicable, with the newer buildings

Budget - Renovations/Renewals

The School Division budgets for repairs and renewals using the National Building Research Board recommendations. The School Board recommends that 2 to 4 % of current replacement value of facilities be budgeted annually for repairs and renewals. The current replacement value of schools is approximately \$2,668,786,000.

Prince William County Schools has established an average annual renewal and repair target of 3% of the current replacement value of facilities with 1.5% for preventive maintenance and 1.5% for repairs and renewals. The amount targeted to be budgeted each year varies from approximately 2.2% to 3.4%, dependent upon the year of the Commonwealth of Virginia’s biennium funding. The target to be budgeted in FY 2018 for repairs, renovations, and maintenance is \$80,064,000 (3.0% of value), with the estimated budget for maintenance renovations, renewals, technology, and energy improvements in FY 2018 at \$59,329,000 (2.2% of value); of which \$11,298,000 will be bond funded.

<i>School Renewals / Major Infrastructure Renovations may include:</i>	
HVAC Systems	Lockers
Lighting	Roof Replacement
Electrical System	Flooring
Plumbing	Painting
Fire Alarm System	Technology
Security System	Casework
Telephone and Intercom Systems	Doors / Hardware
American Disability Act (ADA)	Site Improvements
Bleachers	Title IX Improvements
Elementary School P.E. Space	Clinic Improvements
Secure Access Improvements	

The FY 2018 budget includes Phase 1 funds for renewal at River Oaks Elementary School and Phase 2 funds for renewals at Antietam, McAuliffe, Mullen, and Westridge Elementary Schools and Lake Ridge and Saunders Middle Schools; roof repairs/replacements for Minnieville and Sudley Elementary Schools, Fred Lynn Middle School, and Woodbine Special School; portable classroom relocations, and various kitchen upgrades, energy infrastructure improvements, HVAC upgrades, asphalt improvements, Technology Improvements, and Title IX improvements. Site acquisition funds for the 14th high school are also included in the FY 2018 budget.

Major Maintenance

To improve and maintain current facilities, each school is evaluated at 7-year intervals and major maintenance repairs are scheduled.

Based on restricted funding levels, many of the following major maintenance items will not be addressed. Repairs are made on an ‘as need’ basis until other funding sources become available.

<i>Typical Major Maintenance Activities</i>	
<i>7-Year Cycle</i>	<i>14-Year Cycle</i>
Carpeting (Partial)	Paint Exterior and Interior (Partial)
Paint Hallways, Offices, Exterior Doors, Kitchens (Partial)	Repave / Seal Coat Parking Lot, Paved Areas, and Tennis Courts
Seal Coat Paved Areas and Repaint	Re-key Interior and Exterior Doors
Minor HVAC Repairs	Repair / Replace Fencing and Backstops
Repair Concrete Sidewalks and Curbs	Carpeting (Partial)
Clean and Repair Storm Drains	Update Food Service Equipment (Partial)
Repair Fencing	Minor Roof Repairs
Electrical System Preventive Maintenance	Update Plumbing Fixtures
Trim Trees / Landscaping	Update Electrical Service
Re-Lamp Interior and Exterior Light Fixtures	Update HVAC Controls
	Minor Chiller Rebuilding
	Stage Lighting / Curtains

Schedule of Renovations and Renewals

Fiscal Year	Year Opened	Project	Proposed Funding
2017	<i>1990</i>	Antietam Elementary School - Renewal (Funding Phase 1)	<i>Previously Funded/Under Construction</i>
	<i>1989</i>	McAuliffe Elementary School - Renewal (Funding Phase 1)	
	<i>1990</i>	Mullen Elementary School - Renewal (Funding Phase 1)	
	<i>1989</i>	Westridge Elementary School - Renewal (Funding Phase 1)	
	<i>1989</i>	Lake Ridge Middle School - Renewal (Funding Phase 1)	
	<i>1988</i>	Saunders Middle School - Renewal (Funding Phase 1)	
		Gar-Field High School - Roof Replacement (Partial)	
		Hylton High School - Roof Replacement (Funding Phase 2)	
		Kitchen - Upgrades	
		Energy Infrastructure Improvements	
		HVAC Equipment and Controls - Upgrades	
		Asphalt - Upgrades	
		Portable Classroom Relocation	
	Title IX Improvements		
	Technology Improvement Program - Upgrades		
2018		Antietam Elementary School - Renewal (Funding Phase 2)	\$2,000,000
		McAuliffe Elementary School - Renewal (Funding Phase 2)	\$2,000,000
		Mullen Elementary School - Renewal (Funding Phase 2)	\$1,950,000
		Westridge Elementary School - Renewal (Funding Phase 2)	\$1,852,000
		Minnieville Elementary School - Partial Roof Replacement	\$433,000
		Sudley Elementary School - Partial Roof Replacement	\$433,000
		Fred Lynn Middle School - Partial Roof Replacement	\$1,400,000
		Woodbine Special School - Roof Replacement	\$434,000
		Kitchen - Upgrades	\$330,000
		Asphalt - Upgrades	\$989,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		HVAC Equipment and Controls - Upgrades	\$900,000
		Title IX Improvements	\$270,000
		Technology Improvement Program - Upgrades	\$3,000,000
	Total - Fiscal Year 2018	\$17,491,000	

Schedule of Renovations and Renewals

Fiscal Year	Year Opened	Project	Proposed Funding	
2019	1996	River Oaks Elementary School - Renewal (Funding Phase 2)	\$3,200,000	
		Leesylvania Elementary School - Renewal (Funding Phase 1)	\$7,685,000	
		1994	Marshall Elementary School - Renewal (Funding Phase 1)	\$7,685,000
		1991	Montclair Elementary School - Renewal (Funding Phase 1)	\$7,685,000
		1995	Old Bridge Elementary School - Renewal (Funding Phase 1)	\$7,685,000
		Beville Middle School - Roof Replacement	\$2,100,000	
		Parkside Middle School - Partial Roof Replacement	\$2,900,000	
		Roof Replacements/Repairs (TBD)	\$850,000	
		HVAC Equipment and Controls - Upgrades	\$850,000	
		Rippon Middle School - Fenestration Improvements - Phase 1	\$1,057,000	
		Kitchen - Upgrades	\$500,000	
		Asphalt - Upgrades	\$600,000	
		Portable Classroom Relocation	\$500,000	
		Energy Infrastructure Improvements	\$1,000,000	
		Title IX Improvements	\$280,000	
		Technology Improvement Program - Upgrades	\$3,500,000	
		Total - Fiscal Year 2019	\$48,077,000	
2020		Leesylvania Elementary School - Renewal (Funding Phase 2)	\$3,721,000	
		Marshall Elementary School - Renewal (Funding Phase 2)	\$3,721,000	
		Montclair Elementary School - Renewal (Funding Phase 2)	\$3,721,000	
		Old Bridge Elementary School - Renewal (Funding Phase 2)	\$3,721,000	
	1996	Bennett Elementary School - Renewal (Funding Phase 1)	\$8,935,000	
	1995	Mountain View Elementary School - Renewal (Funding Phase 1)	\$8,935,000	
	1998	Penn Elementary School - Renewal (Funding Phase 1)	\$8,935,000	
		Potomac View Elementary School - Roof Replacement	\$1,175,000	
		Belmont Elementary School - Partial Roof Replacement	\$827,000	
		Roof Replacements/Repairs (TBD)	\$980,000	
		HVAC Equipment and Controls - Upgrades	\$1,000,000	
		Portable Classroom Relocation	\$500,000	
		Energy Infrastructure Improvements	\$1,000,000	
		Title IX Improvements	\$290,000	
		Technology Improvement Program - Upgrades	\$4,000,000	
	Total - Fiscal Year 2020	\$51,461,000		

Schedule of Renovations and Renewals

Fiscal Year	Year Opened	Project	Proposed Funding
2021	<i>1991</i>	Beville Middle School - Renewal (Funding Phase 1)	\$12,420,000
	<i>1991</i>	Hylton High School - Renewal (Funding Phase 1)	\$18,500,000
		Bennett Elementary School - Renewal (Funding Phase 2)	\$3,042,000
		Mountain View Elementary School - Renewal (Funding Phase 2)	\$3,042,000
		Penn Elementary School - Renewal (Funding Phase 2)	\$3,042,000
		Transportation Bus Parking (TBD)	\$1,600,000
		Rippon Middle School - Fenestration Improvements - Phase 2	\$1,300,000
		Roof Replacements/Repairs (TBD)	\$2,681,000
		HVAC Equipment and Controls - Upgrades	\$1,400,000
		Kitchen - Upgrades	\$710,000
		Asphalt - Upgrades	\$1,000,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		Title IX Improvements	\$300,000
		Technology Improvement Program - Upgrades	\$4,500,000
	Total - Fiscal Year 2021		\$55,037,000
2022		Beville Middle School - Renewal (Funding Phase 2)	\$6,201,000
		Hylton High School - Renewal (Funding Phase 2)	\$5,766,000
	<i>1998</i>	Bristow Run Elementary School - Renewal (Funding Phase 1)	\$8,810,000
	<i>2000</i>	Signal Hill Elementary School - Renewal (Funding Phase 1)	\$8,810,000
	<i>2000</i>	Benton Middle School - Renewal (Funding Phase 1)	\$14,056,000
		Roof Replacements/Repairs (TBD)	\$2,956,000
		HVAC Equipment and Controls - Upgrades	\$2,000,000
		Fenestration Improvements (TBD)	\$2,000,000
		Kitchen - Upgrades	\$700,000
		Asphalt - Upgrades	\$1,000,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		Title IX Improvements	\$310,000
		Technology Improvement Program - Upgrades	\$5,000,000
		Total - Fiscal Year 2022	

Schedule of Renovations and Renewals

Fiscal Year	Year Opened	Project	Proposed Funding
2023		Renewals:	
	2001	Cedar Point Elementary School (Funding Phase 1)	\$7,980,000
	2001	Swans Creek Elementary School (Funding Phase 1)	\$7,980,000
	2000	Forest Park High School (Funding Phase 1)	\$17,600,000
		Bristow Run Elementary School (Funding Phase 2)	\$4,399,000
		Signal Hill Elementary School (Funding Phase 2)	\$4,399,000
		Benton Middle School (Funding Phase 2)	\$5,498,000
		Roof Replacements/Repairs (TBD)	\$3,277,000
		HVAC Equipment and Controls - Upgrades	\$2,000,000
		Kitchen - Upgrades	\$1,700,000
		Asphalt - Upgrades	\$1,000,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		Title IX Improvements	\$320,000
		Technology Improvement Program - Upgrades	\$5,500,000
	Total - Fiscal Year 2023	\$63,153,000	
2024		Renewals:	
		Cedar Point Elementary School (Funding Phase 2)	\$5,891,000
		Swans Creek Elementary School (Funding Phase 2)	\$5,891,000
		Forest Park High School (Funding Phase 2)	\$8,745,000
	2002	Ashland Elementary School (Funding Phase 1)	\$9,715,000
	2002	Marsteller Middle School (Funding Phase 1)	\$18,157,000
		Roof Replacements/Repairs (TBD)	\$5,477,000
		HVAC Equipment and Controls - Upgrades	\$2,000,000
		Fenestration Improvements (TBD)	\$2,000,000
		Kitchen - Upgrades	\$1,000,000
		Asphalt - Upgrades	\$1,000,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		Title IX Improvements	\$330,000
		Technology Improvement Program - Upgrades	\$6,000,000
	Total - Fiscal Year 2024	\$67,706,000	

Schedule of Renovations and Renewals

Fiscal Year	Year Opened	Project	Proposed Funding
2025	2002	Ashland Elementary School - Renewal (Funding Phase 2)	\$4,851,000
	2002	Marsteller Middle School - Renewal (Funding Phase 2)	\$3,404,000
		Renewal of Various Schools (based on age, condition, and availability of funds). See potential list of upcoming schools and facilities at end of table.	\$45,677,000
		Roof Replacements/Repairs (TBD)	\$4,211,000
		HVAC Equipment and Controls - Upgrades	\$2,000,000
		Fenestration Improvements (TBD)	\$2,000,000
		Kitchen - Upgrades	\$1,000,000
		Asphalt - Upgrades	\$1,000,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		Title IX Improvements	\$340,000
		Technology Improvement Program - Upgrades	\$6,500,000
		Total - Fiscal Year 2025	\$72,483,000
2026		Renewal of Various Schools (based on age, condition, and availability of funds). See potential list of upcoming schools and facilities at end of table.	\$54,365,000
		Roof Replacements/Repairs (TBD)	\$6,000,000
		HVAC Equipment and Controls - Upgrades	\$2,000,000
		Fenestration Improvements (TBD)	\$2,000,000
		Kitchen - Upgrades	\$2,000,000
		Asphalt - Upgrades	\$2,000,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		Title IX Improvements	\$350,000
		Technology Improvement Program - Upgrades	\$7,000,000
	Total - Fiscal Year 2026	\$77,215,000	

Schedule of Renovations and Renewals

Fiscal Year	Year Opened	Project	Proposed Funding
2027		Renewal of Various Schools (based on age, condition, and availability of funds). See potential list of upcoming schools and facilities at end of table.	\$59,156,000
		Roof Replacements/Repairs (TBD)	\$6,000,000
		HVAC Equipment and Controls - Upgrades	\$2,000,000
		Fenestration Improvements (TBD)	\$2,000,000
		Kitchen - Upgrades	\$2,000,000
		Asphalt - Upgrades	\$2,000,000
		Portable Classroom Relocation	\$500,000
		Energy Infrastructure Improvements	\$1,000,000
		Title IX Improvements	\$360,000
		Technology Improvement Program - Upgrades	\$7,500,000
	<i>Total - Fiscal Year 2027</i>		\$82,516,000
Total (FY 2018-2027)			\$594,248,000

Year Opened	List of Potential Upcoming Schools and Facilities for Renewal
2003	Alvey Elementary School
2004	Ellis Elementary School
2002	Bull Run Middle School
	Transportation Center (TBD)
2004	Williams Elementary School
2004	Porter Traditional School
2004	Freedom and Battlefield High Schools
2005	Glenkirk Elementary School
2005	Victory Elementary School

Summary

- Projected Growth in Students, Fiscal Years 2018-27 17,848
- Current Portable Classrooms 211
- New School Facilities 12
 - Elementary Schools 5
 - Middle Schools 3
 - High Schools 3
 - New Alternative School 1
- School Additions (8 Schools) 93
 - Elementary School Classroom Additions (6 Schools) 63
 - Middle School Classroom Additions (2 Schools) 30
- Support Facilities
 - Western Transportation Center
 - New Dominion – Special Needs Transportation
 - Eastern Area Intake/ELL (Relocation from Ann Ludwig)
- Total Additional Capacity 17,313
- New Schools, Additions, and Other Bond-Funded Projects
 - New School Facilities \$ 887,616,000
 - Classroom Additions \$ 114,364,000
 - Site Acquisition \$ 29,000,000
 - Renovations and Renewals \$ 605,546,000

TOTAL CAPITAL IMPROVEMENTS PROGRAM \$1,636,526,000

Capital Projects Funded Fiscal Year 2018	
o	Additions - Pattie ES, Lake Ridge MS
o	Construction of Independence Non-Traditional School
o	Eastern Area Intake/ELL Relocation from Ann Ludwig
o	Renewals & Repairs:
	*Phase 1 Funding - River Oaks ES
	*Phase 2 Funding - Antietam ES, McAuliffe ES, Mullen ES, Westridge ES, Lake Ridge MS, Saunders MS
o	HVAC upgrades/repairs, Roof repairs/replacement, Kitchen upgrades, Asphalt upgrades, portable classroom relocation
	Continue Title IX, Energy, and Technology Improvements
o	Site Acquisition Funds - 14 th HS

APPENDIX A

School Facility Information

School Facility Data by School Type

- Elementary, Middle, High, Special, Alternative, and Other
- School Name
- Planning Capacity
- Portable Classrooms 2016-17
- Regular Classrooms
- Year Opened
- Year of Last and Next School Renovation
- Year of School Addition(s)
- Building Square Feet
- Site Acres

School Facility Information

Prince William County Schools

Elementary School	Program Capacity	Portable Classrooms 2016-17	Regular Classrooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
Alvey ES	857		41	2003	FY 25						83,084	20.2
Antietam ES	569	1	31	1990	FY 17			2017			64,706	14.9
Ashland ES	979		46	2002	FY 23			2008	5		98,461	18.1
Bel Air ES	449	3	28	1968		2008		2008	8		53,712	15.0
Belmont ES	540	3	35	1967		2006		2006	4	2017	74,332	14.3
Bennett ES	847		40	1996	FY 19			2000	8		83,969	15.3
Bristow Run ES	795		40	1998	FY 21			2004	8		83,885	21.7
Buckland Mills ES	938		43	2006							89,936	15.0
Cedar Point ES	874		41	2001	FY 23						83,084	15.5
Coles ES	469	3	25	1968		2009					52,745	17.0
Dale City ES	347	5	25	1967		2006		2001	4		44,333	14.8
Dumfries ES	419	6	27	1918		2014		1989	8		44,925	10.0
Ellis ES	481	3	32	2004	FY 25						76,724	10.5
Enterprise ES	444	1	26	1978		2009					51,260	15.0
Featherstone ES	425	5	29	1961		2015		2015	6		56,246	12.0
Fitzgerald ES	776	2	46	2008							106,170	11.2
Glenkirk ES	839		41	2005							83,084	15.6
Gravelly ES	955		43	2008							95,314	18.0
Haymarket ES	946		44	2014							98,736	24.3
Henderson ES	808	2	40	1985		2015		2017	11		76,077	14.9
Kerrydale ES	345	5	24	1973		2007					46,300	15.4
Kilby ES Replacement	646	2	45	2017		2001					98,615	12.8
King ES	431		26	1981		2015					57,546	15.2
Lake Ridge ES	535	7	27	1983		2015					59,904	15.1
Leesylvania ES	631	2	41	1996	FY 19						83,084	16.3
Loch Lomond ES	433	3	30	1962		2015		2013	4		58,278	10.7
Marshall ES	770		35	1994	FY 19			1999	4		62,700	24.2
Marumsc Hills ES	589	11	35	1966		2006		2006	2	2009	56,651	12.2
McAuliffe ES	436		28	1989	FY 17			2017			60,825	15.1
Minnieville ES	447	1	28	1972		2005					53,028	15.2
Montclair ES	735		35	1991	FY 19			2008	4		70,928	15.9
Mountain View ES	722		35	1995	FY 19			2002	4		67,815	30.0
Mullen ES	707		43	1990	FY 17			1999	4	2013	82,219	15.0
Neabsco ES	679	5	43	1969		2009		2017	10		77,389	12.8
Occoquan ES	419	6	26	1927		2002		2003	5		55,225	10.1
Old Bridge ES	553	1	32	1995	FY 19						74,433	17.9
Parks ES	853		41	2006							83,084	15.2
Pattie ES	795		36	1978		2013					53,767	15.0
Penn ES	797	2	39	1998	FY 19			2013	7		87,542	16.9
Piney Branch ES	965		44	2011							104,448	21.0
Potomac View ES	529	14	37	1964		2005		2005	4	2009	60,756	12.4
River Oaks ES	633	2	38	1990	FY 18			2014	7		80,618	15.2
Rockledge ES	522	3	31	1972		2007		2009	7		64,769	16.2
Signal Hill ES	803	1	41	2000	FY 21						83,084	24.5
Sinclair ES	682		42	1968		2009		2001	6	2013	75,698	15.0
Springwoods ES	593	7	28	1985		2015					58,221	15.1
Sudley ES	640	1	38	1972		2004		2013	10		73,457	14.0
Swans Creek ES	653	4	38	2001	FY 23			2012	6		86,934	18.5
Triangle ES	743		44	2010							103,679	18.9
Tyler ES	558		28	1968		2007		2007	4		56,014	25.5
Vaughan ES	607	9	36	1964		2005		2001	4	2009	58,967	13.6
Victory ES	935		43	2005							89,911	21.2
West Gate ES	516	1	36	1964		2009		2013	4		59,727	12.1
Westridge ES	710		34	1989	FY 17			2012	6		70,559	15.0
Williams ES	707	6	41	2004							83,084	13.6
Wilson ES	997		49	2016							106,345	19.5
Wood ES	998		44	2011							104,448	33.8
Yorkshire ES	793	1	46	2009							106,614	13.3
Yung ES	1,041		45	2015							107,273	20.8
Total	39,905	128	2,155						164		4,424,722	972.7

School Facility Information

Prince William County Schools

Combined School	Planning Capacity	Portable Classrooms 2015-16	Regular Class-rooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
Nokesville School, The	1,098		55	2014							141,832	48.2
Pennington Traditional	608		31	1969		2012					56,330	15.0
Porter Traditional	627		32	2004							71,245	16.9
Total	2,333		118								269,407	80.1

Middle School	Planning Capacity	Portable Classrooms 2015-16	Regular Class-rooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
Benton MS	1,464		76	2000	FY 21		2013	11			151,130	48.2
Beville MS	1,191		65	1991	FY 21	1998					134,140	42.1
Bull Run MS	1,233		65	2002	FY 25						135,309	39.4
Gainesville MS	1,233	5	65	2007							135,309	39.4
Graham Park MS	867	8	47	1963		2001	2001	4			110,514	21.9
Hampton MS	982	2	54	1970		2010	2002	8			124,610	30.0
Lake Ridge MS	1,191		65	1989	FY 17						132,258	34.1
Lynn MS	1,170		64	1964		2001					131,974	28.6
Marsteller MS	1,233	5	65	2002	FY 23						135,309	36.4
Parkside MS	1,453		74	1963		2000	2014	15			145,677	30.0
Potomac MS	1,464		76	2006			2013	11			151,130	36.4
Reagan MS	1,233		65	2012							134,765	41.9
Rippon MS	1,390	1	63	1967		2010	2016	8			132,607	30.2
Saunders MS	1,212		64	1988	FY 17						137,088	29.5
Stonewall MS	1,003	5	52	1964		2002					127,673	32.2
Woodbridge MS	1,066	4	56	1964		2003					124,511	37.4
Total	19,385	30	1,016					57		0	2,144,004	557.7

High School	Planning Capacity	Portable Classrooms 2015-16	Regular Class-rooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
Battlefield HS	2,053	14	101	2004							285,086	78.8
Brentsville HS	1,110		53	1965		2000	2000	9	1980		163,066	29.0
Colgan HS	2,053		102	2016							339,803	109.3
Forest Park HS	2,053		101	2000	FY 21						283,268	79.1
Freedom HS	2,053	4	101	2004							285,886	80.7
Gar-Field HS	2,839		128	1972		2003					353,742	91.5
Hylton HS	2,053		101	1991	FY 21						282,346	74.8
Osborn Park HS	2,430		115	1975		2006					328,386	56.1
Patriot HS	2,053	20	101	2011							320,124	60.0
Potomac HS	2,357		113	1981		2012	2013	30			273,329	75.1
Stonewall Jackson HS	2,409	3	117	1973		2005					328,540	56.6
Woodbridge HS	2,734		125	1974		2004					352,497	52.7
Total	26,197	41	1,258					39		0	3,596,073	843.7

Special School	Planning Capacity	Portable Classrooms 2015-16	Regular Class-rooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
Independent Hill SE / PACE East			20	1967							49,204	10.0
PACE West SE			21	2012							39,998	13.5
Woodbine SE		1	4	1953		1990					8,320	1.9
Total	0	1	45					0		0	97,522	25.4

Alternative School	Planning Capacity	Portable Classrooms 2015-16	Regular Class-rooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
New Directions Alt			13	2004							20,245	
New Dominion Alt		11	5	1975		1993					14,749	5.0
Total	0	11	18					0		0	34,994	5.0

School Facility Information

Prince William County Schools

Administrative	Planning Capacity	Portable Classrooms 2015-16	Regular Classrooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
Ann Ludwig				1975							14,220	4.8
Independent Hill Complex				1968							139,947	34.2
Kelly Leadership Center				2008							145,747	20.0
Total	0	0	0					0		0	299,914	59.0

Transportation	Planning Capacity	Portable Classrooms 2015-16	Regular Classrooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
McCuin Transportation Cntr				2002							8,400	11.5
Transportation Center Central				2005							14,934	29.9
Transportation Center East				2002							15,565	16.8
Transportation Cntr (Hooe Rd)				1979							28,028	20.0
Total	0	0	0					0		0	66,927	78.2

All Facilities	Planning Capacity	Portable Classrooms 2015-16	Regular Classrooms	Year Opened	School Renovation		School Addition(s)				Building Square Feet	Site Acres
					Next	Last	Year	# Class-rooms	Year	# Class-rooms		
Total	87,820	211	4,610					260		44	10,933,563	2,621.8

APPENDIX B

Student Enrollment & Housing Data

Student Enrollment & Housing Data

- Student Enrollment Forecasting
 - Housing-unit Method
 - Grade Progression Ratio Method
- Alternative Solutions to School Overcrowding
- Student Enrollment Data: Current and Projected Enrollment
 - by School (Elementary, Middle, High, and Special/Alternative Education), School Years 2016-26
- Housing Units in Residential Development
 - by School (Elementary, Middle, and High)
- Historical and Projected Enrollment Data
- Student Enrollment Projections - Error Rate Analysis
- Portable Classrooms
- Various Charts and Graphs
- Geographic Areas – Map and Table

Student Enrollment Forecasting

Most forecasts share common features. They tend to be an extrapolation of the past, involve some level of judgment, and are inherently not perfect predictors of the future. These features contribute to why it's indispensable to continually evaluate the forecasting methods used and the accuracy of their projections. The primary goal in the enrollment forecasting process is to reduce statistical error so that the projections can become better predictors of future student enrollments, resulting in the ability to place greater confidence in them when planning future capital improvements. The forecasts rely on spatial and aspatial data that are manipulated and processed by Geographic Information System (GIS) software and statistical software packages, respectively. The methods used to produce student enrollment forecasts in PWCS are discussed in greater detail and communicated through flow charts in the following pages.

Methodology

The student enrollment forecasts are calculated combining two widely-used techniques in projecting student enrollment that are commonly referred to as the **Housing-unit Method** and the **Grade Progression Method**. One caveat is that judgmental adjustments, which are common in forecasting, are often used to fine-tune the enrollment forecasts. The combination of statistical methods was chosen for two primary reasons. First, the model produced by them is supported by industry best practices and scholarly literature. Second, they are relatively inexpensive to produce. Each primary method is now discussed more extensively.

Housing-Unit Method

The Housing-Unit Method establishes a relationship between housing units and student enrollment. The relationship is calculated for a specific geography in PWC by dividing the number of students residing in the geographic region by the number of existing housing units. In PWCS, the resulting value is referred to as a Student Generation Factor. It can be interpreted as the number of students on average that housing units generated in a specific region. Factors are calculated at varying geographies (e.g., county-wide, elementary school attendance area, and Planning Zone) and for each housing unit type (e.g., single-family detached, townhouse, and multifamily). For future years, the projected ratio of students per housing unit, in concert with moving these ratios forward in time via the Grade Progression Ratio Method, is multiplied by the number of predicted housing units by year to produce the forecasts of total students in Prince William County Schools.

Grade Progression Ratio Method

The Grade Progression Ratio Method used in PWCS, is the weighted average of historical grade progression ratios. The calculated ratio for each grade level is multiplied by its corresponding grade level cohort for a particular year to project the subsequent year's enrollment. An example below is provided to help explain the method.

Below is a table that tabulates the historical record of total sixth and seventh grade students for the current year (i.e., Year₍₀₎) and the previous three years. Beneath the table is Grade Progression Ratio Method used with the provided data. For the sake of simplicity, no weighting is included in the example calculation, although more recent years are weighted more significantly in the actual projections used in PWCS. Averaging progression ratios for multiple years in the progression ratio calculation lessens the effect of any given year on the forecast, effectively smoothing the historical data. The forecaster can adjust the number of years used to calculate the progression ratio with the intent of attempting to control for outliers and to include the previous years that are believed to most closely represent the years being forecasted.

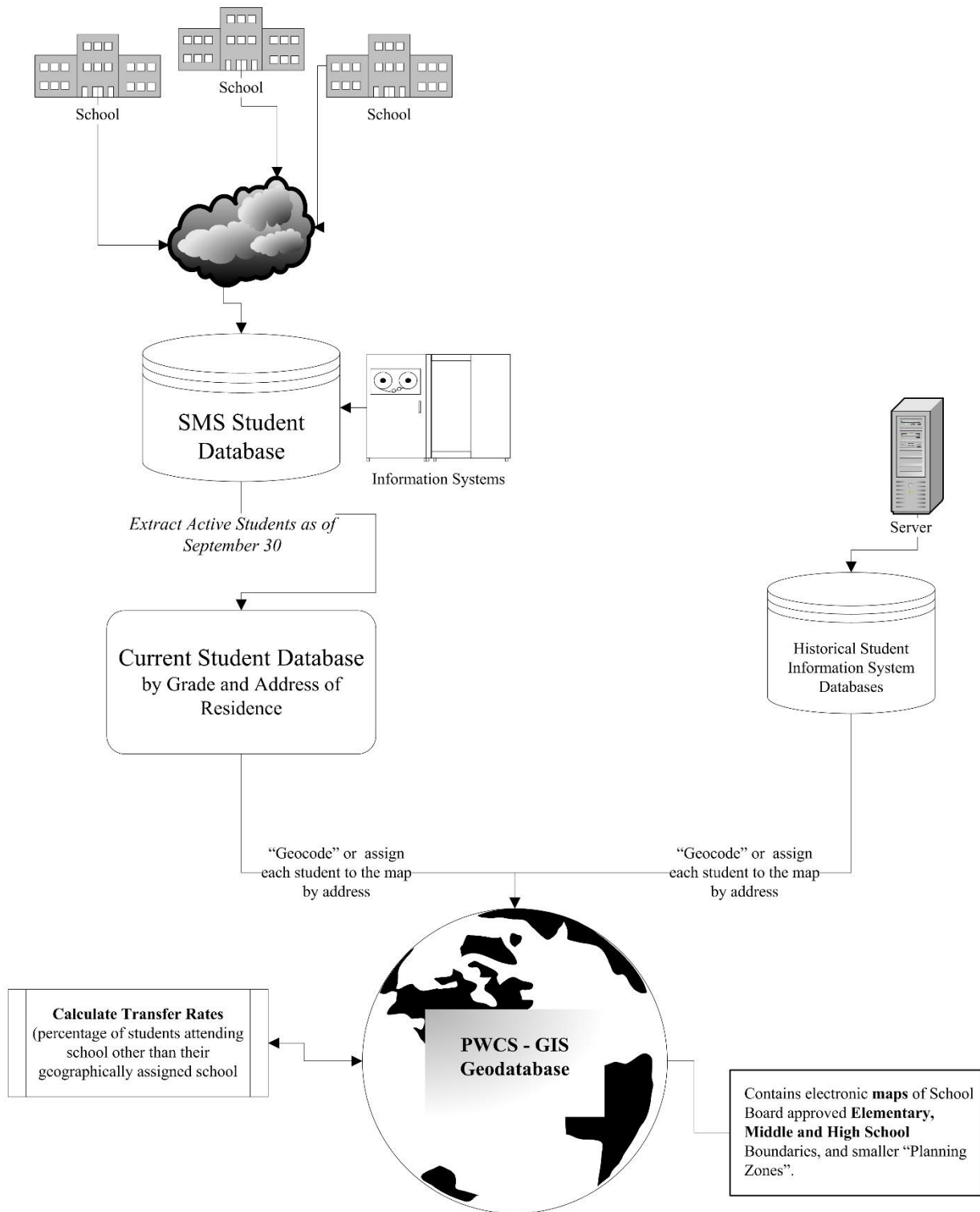
Grade	Year ₍₋₃₎	Year ₍₋₂₎	Year ₍₋₁₎	Year ₍₀₎	Progression Ratio	Year ₍₊₁₎
6 th	3,888	4,066	4,348	4,581		
7 th	N/A	4,024	4,184	4,525	1.0350	4,741

1. **Progression Ratio** = $(7^{\text{th}} \text{Year}_{(-2)} + 7^{\text{th}} \text{Year}_{(-1)} + 7^{\text{th}} \text{Year}_{(0)}) / (6^{\text{th}} \text{Year}_{(-3)} + 6^{\text{th}} \text{Year}_{(-2)} + 6^{\text{th}} \text{Year}_{(-1)})$
7th Year₍₀₎ indicates the 7th grade cohort of Current Year.
2. **Progression Ratio** = $(4,024 + 4,184 + 4,525) / (3,888 + 4,066 + 4,348) = 1.0350$
3. **Forecasted 7th Year₍₊₁₎ Student Enrollment** = $4,581 \times 1.0350 = 4,741$

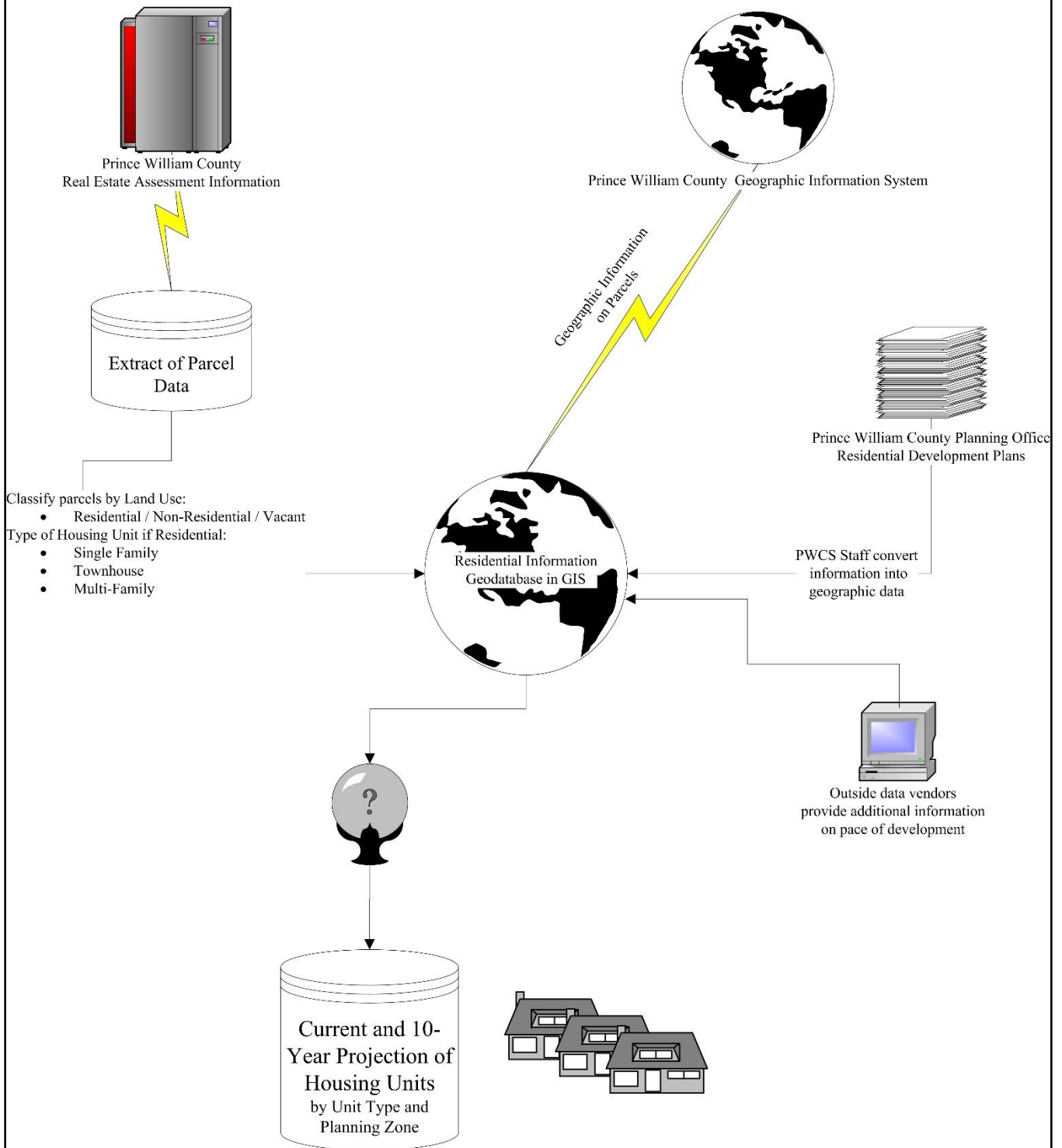
Student Enrollment Forecast Accuracy

The model used to project student enrollment in PWCS is effective, and with accurate data and correctly forecasted parameters, can provide reasonably accurate forecasts of future. Historically, it has yielded smaller errors at larger geographies. An average error of less than 1% has been associated with the Divisionwide one-year projections since the mid-1980s. Success at the school level, a relatively smaller geography, has varied by school. See charts on page B-16 and B-17 for historical error rates.

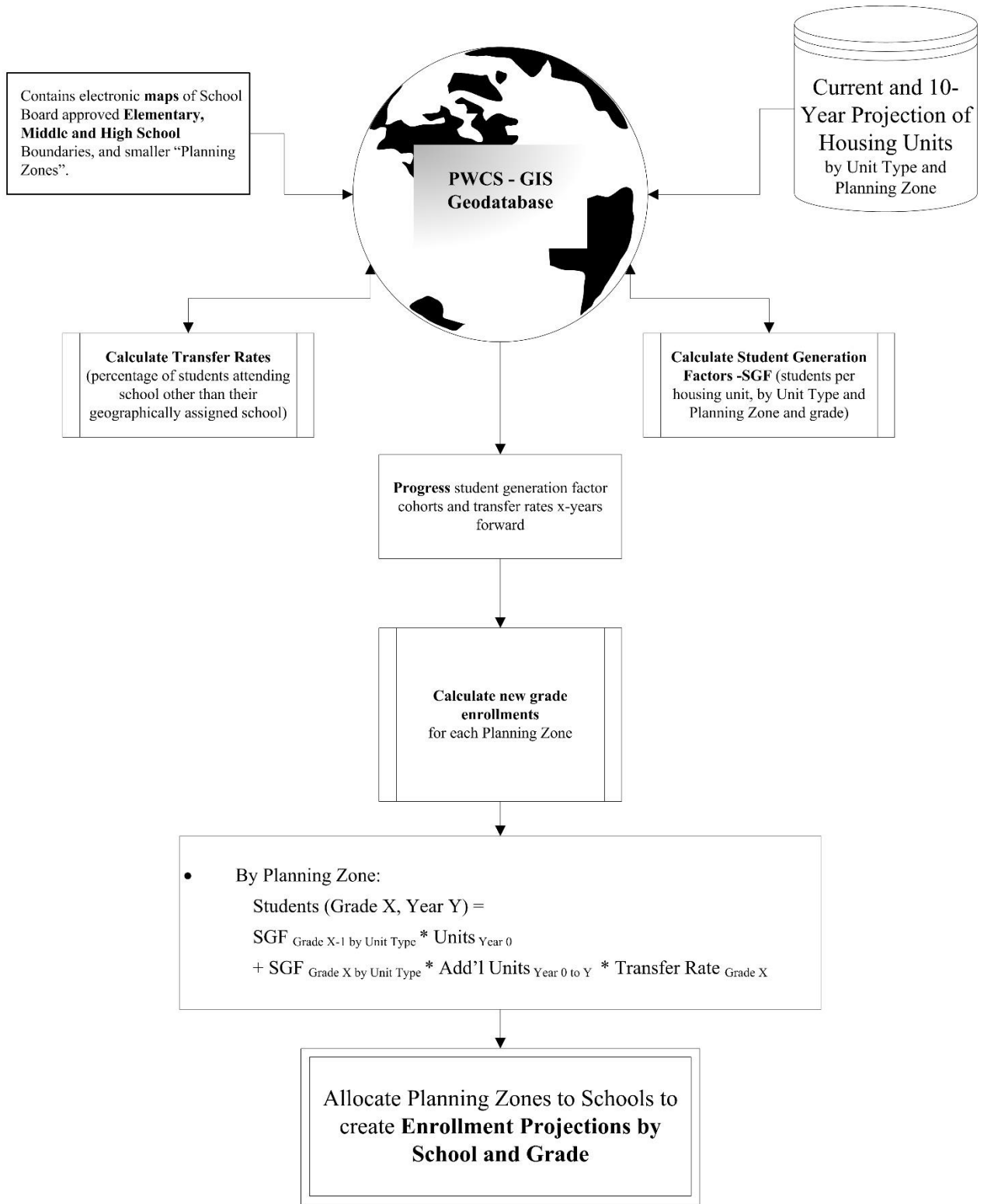
Analysis of Student Information



Analysis of Housing Unit Information



Preparation of Student Enrollment Forecasts



Alternative Solutions to School Overcrowding

There are several general methods that have been considered to alleviate overcrowding in schools.

- Boundary changes - For the opening of new schools or to shift student populations
- Optimization of boundaries so all available space in the county will be used
- Placement of portable classrooms
- New construction
- Freezing transfers
- Program changes – Examples:
 - Shifting eighth grade to a high school with unused space;
 - Moving PK Special Education programs;
 - Increasing pupil/teacher ratio;
 - Split shift.
- Year-Round Schooling

The method chosen for relieving overcrowding at a given school is determined by several criteria. These criteria include continuity and quality of educational program; maintenance of contiguous communities; transportation considerations; using centerline on divided highways when possible; and topographical features.

Student Enrollment Data: Current and Projected Enrollment

Elementary Schools

SY 2016-17 to SY 2026-27

Elementary School	Available Space		2016-17			2017-18			2021-22			2026-27		
	Program Capacity	Portable Classrooms	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util
Alvey	857		685	172	80.0%	650	206	75.9%	687	170	80.2%	727	129	84.9%
Antietam	569	1	650	-81	114.3%	666	-98	117.2%	664	-96	116.8%	693	-125	122.0%
Ashland	979		800	179	81.7%	791	189	80.7%	802	177	81.9%	847	132	86.5%
Bel Air	449	3	540	-91	120.3%	410	38	91.5%	414	35	92.3%	432	17	96.3%
Belmont	353 ¹	3	432	-79	122.2%	514	26	95.2%	547	-7	101.3%	724	-184	134.1%
	540 ²													
Bennett	847		685	162	80.9%	684	163	80.8%	789	58	93.2%	870	-23	102.7%
Bristow Run	795		676	119	85.1%	698	97	87.8%	665	129	83.7%	705	89	88.8%
Buckland Mills	938		667	271	71.1%	658	280	70.1%	709	229	75.6%	821	117	87.5%
Cedar Point	874		562	312	64.3%	548	326	62.7%	568	305	65.0%	593	280	67.9%
Coles	469	3	456	13	97.3%	415	54	88.6%	445	24	94.9%	468	0	99.9%
Covington-Harper	750		N/A	N/A	N/A	531	219	70.8%	1,092	-342	145.6%	1,585	-835	211.4%
Dale City	347	5	452	-105	130.4%	439	-92	126.6%	443	-96	127.8%	463	-117	133.7%
Dumfries	419	6	513	-94	122.3%	446	-27	106.4%	457	-37	108.9%	477	-58	113.8%
Ellis	481	3	588	-107	122.1%	585	-103	121.5%	593	-112	123.3%	895	-414	186.0%
Enterprise	444	1	401	43	90.3%	392	52	88.3%	392	52	88.4%	410	35	92.2%
Featherstone	425	5	592	-167	139.4%	502	-77	118.1%	489	-65	115.2%	513	-88	120.8%
Fitzgerald	776	2	872	-96	112.4%	877	-101	113.1%	1,004	-228	129.4%	1,141	-365	147.1%
Glenkirk	839		760	79	90.6%	775	65	92.3%	750	90	89.3%	783	56	93.3%
Gravelly	955		759	196	79.5%	725	230	75.9%	795	161	83.2%	869	86	91.0%
Haymarket	946		770	176	81.4%	830	116	87.7%	937	9	99.0%	1,044	-98	110.3%
Henderson	555 ¹	2	628	-73	113.2%	808	0	100.0%	880	-72	108.9%	928	-120	114.9%
	808 ²													
Kerrydale	345	5	511	-166	148.2%	503	-158	145.8%	502	-158	145.7%	524	-179	152.1%
Kilby	333 ¹	2	436	-103	130.8%	689	-43	106.7%	704	-58	109.1%	925	-279	143.2%
	646 ²													
King	431		410	21	95.2%	408	23	94.6%	443	-12	102.8%	464	-34	107.8%
Lake Ridge	535	7	589	-54	110.2%	579	-45	108.4%	572	-37	107.0%	597	-62	111.7%
Leesylvania	631	2	771	-140	122.1%	770	-139	122.0%	785	-154	124.4%	873	-241	138.2%
Loch Lomond	433	3	556	-123	128.4%	562	-129	129.8%	576	-143	133.1%	611	-178	141.0%
Marshall	770		652	118	84.7%	626	144	81.3%	628	142	81.6%	662	108	86.0%
Marumsc Hills	589	11	828	-239	140.6%	633	-44	107.6%	649	-61	110.3%	698	-109	118.5%
McAuliffe	436		448	-12	102.7%	441	-5	101.1%	423	13	97.0%	442	-6	101.3%
Minnieville	447	1	516	-69	115.3%	507	-59	113.2%	495	-47	110.6%	539	-91	120.4%
Montclair	735		581	154	79.0%	569	166	77.4%	563	173	76.5%	591	144	80.4%
Mountain View	722		578	144	80.1%	550	172	76.2%	565	157	78.3%	622	100	86.1%
Mullen	707		730	-23	103.3%	761	-54	107.7%	752	-45	106.4%	932	-226	131.9%
Neabsco	530 ¹	5	590	-60	111.3%	872	-193	128.5%	851	-172	125.3%	894	-215	131.6%
	679 ²													
Nokesville School, The	659		560	99	84.9%	579	80	87.8%	625	34	94.8%	777	-118	117.9%
Occoquan	419	6	612	-193	145.9%	640	-220	152.5%	650	-230	154.9%	682	-263	162.6%
Old Bridge	553	1	720	-167	130.3%	709	-156	128.3%	746	-193	135.0%	779	-226	141.0%
Parks	853		748	105	87.7%	724	128	84.9%	748	105	87.7%	783	70	91.8%
Pattie	795		698	97	87.8%	697	99	87.6%	698	97	87.8%	729	67	91.6%
Penn	797	2	823	-26	103.3%	851	-54	106.8%	907	-111	113.9%	973	-176	122.1%
Pennington	365		408	-43	111.8%	405	-40	111.1%	405	-40	111.1%	405	-40	111.1%
Piney Branch	965		809	156	83.8%	808	158	83.7%	835	130	86.5%	877	88	90.9%
Porter	375		418	-43	111.5%	420	-45	112.0%	420	-45	112.0%	420	-45	112.0%
Potomac View	529	14	843	-314	159.2%	707	-177	133.5%	688	-158	129.9%	718	-188	135.6%
River Oaks	633	2	737	-104	116.3%	699	-66	110.4%	722	-88	114.0%	776	-143	122.5%
Rockledge	522	3	625	-103	119.7%	632	-110	121.0%	639	-117	122.3%	671	-149	128.5%
Signal Hill	803	1	717	86	89.3%	743	60	92.5%	830	-27	103.4%	961	-159	119.8%
Sinclair	682		757	-75	111.0%	764	-83	112.1%	777	-95	114.0%	811	-129	119.0%
Springwoods	593	7	732	-139	123.5%	739	-147	124.8%	745	-153	125.7%	778	-185	131.2%
Sudley	640	1	698	-58	109.1%	691	-52	108.1%	686	-47	107.3%	717	-77	112.0%
Swans Creek	653	4	783	-130	119.8%	690	-36	105.5%	747	-93	114.3%	803	-150	122.9%
Triangle	743		775	-32	104.3%	810	-67	109.1%	824	-82	111.0%	870	-127	117.1%
Tyler	558		518	40	92.8%	548	10	98.2%	530	28	95.0%	568	-10	101.8%
Vaughan	607	9	801	-194	131.9%	669	-62	110.2%	712	-105	117.3%	763	-156	125.7%
Victory	935		656	279	70.2%	682	252	73.0%	792	142	84.8%	827	108	88.5%
West Gate	516	1	534	-18	103.5%	524	-7	101.4%	520	-4	100.7%	542	-26	105.1%
Westridge	710		760	-50	107.1%	738	-28	103.9%	751	-41	105.8%	784	-74	110.5%
Williams	707	6	1,069	-362	151.1%	795	-87	112.3%	811	-103	114.6%	863	-155	122.0%
Wilson	997		640	357	64.2%	671	326	67.3%	707	290	71.0%	755	242	75.8%
Wood	998		931	67	93.3%	904	94	90.6%	894	104	89.6%	959	39	96.1%
Yorkshire	793	1	816	-23	102.9%	882	-89	111.2%	891	-98	112.4%	932	-139	117.6%
Yung	1,041		697	344	66.9%	726	315	69.7%	810	231	77.8%	1,434	-393	137.7%
Total	40,400 ¹	128	40,569	-169 ³	100.4% ³	40,869	1,182	97.2%	42,757	-706	101.7%	47,337	-5,286	112.6%
	42,051 ²													

Note:

¹ Program Capacity on which available space is calculated for the 2016-17 school year.

² Program Capacity on which available space is calculated for the 2017-18 through 2026-27 school years. It reflects new schools and classroom additions opening for the 2017-18 school year.

³ Figures are calculated based on the 2016-17 total elementary program capacity.

Student Enrollment Data: Current and Projected Enrollment
 Elementary Schools – Additional Space to be Constructed
 SY 2016-17 to SY 2026-27

Elementary School	2016-17			2017-18			2021-22			2026-27		
	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util
2019												
<i>Antietam Elementary Addition (13 rooms)</i>									329			329
<i>Elementary School (East - PW Parkway Area)</i>									924			924
<i>Lake Ridge Elementary Addition (13 rooms)</i>									329			329
<i>Leesylvania Elementary Addition (4 rooms)</i>									83			83
<i>Minnieville Elementary Addition (10 rooms)</i>									187			187
<i>Springwoods Elementary Addition (13 rooms)</i>									329			329
2021												
<i>Elementary School (Cherry Hill Area)</i>									924			924
2022												
<i>Elementary School (Yorkshire Area)</i>												924
2023												
<i>Elementary School (Occoquan/Woodbridge Area)</i>												924
2024												
<i>Elementary School (Stonewall Area)</i>												924
<i>Sum of Additional Seats</i>									3,105			8,223
Total	40,569	-169	100.4%	40,869	1,182	97.2%	42,757	2,399	94.7%	47,337	2,937	94.2%

Student Enrollment Data: Current and Projected Enrollment
Middle Schools
SY 2016-17 to SY 2026-27

Middle School	Available Space		2016-17			2017-18			2021-22			2026-27		
	Capacity	Portable Classrooms	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util
Benton	1,464		1,381	83	94.3%	1,400	64	95.6%	1,205	259	82.3%	1,213	251	82.8%
Beville	1,191		1,088	103	91.4%	1,120	71	94.1%	1,185	6	99.5%	1,209	-18	101.5%
Bull Run	1,233		1,194	39	96.8%	1,163	70	94.3%	1,213	20	98.4%	1,356	-123	110.0%
Gainesville	1,233	5	1,385	-152	112.3%	1,458	-225	118.3%	1,454	-221	117.9%	1,750	-517	141.9%
Graham Park	867	8	1,042	-175	120.2%	1,060	-193	122.2%	1,159	-292	133.7%	1,216	-349	140.3%
Hampton	982	2	1,050	-68	106.9%	1,071	-89	109.1%	1,158	-176	117.9%	1,243	-261	126.6%
Lake Ridge	1,191 ¹		1,220	-29	102.4%	1,263	-72	106.0%	1,480	-16	101.1%	1,510	-46	103.1%
	1,464 ²													
Lynn	1,170		1,043	127	89.1%	1,101	69	94.1%	1,332	-162	113.8%	1,545	-375	132.0%
Marsteller	1,233	5	1,334	-101	108.2%	1,389	-156	112.7%	1,231	2	99.8%	1,430	-197	115.9%
Nokesville School, The	439		341	98	77.7%	331	108	75.3%	334	105	76.1%	422	17	96.1%
Parkside	1,453		1,212	241	83.4%	1,312	141	90.3%	1,596	-143	109.9%	1,728	-275	118.9%
Pennington	243		235	8	96.7%	243	0	100.0%	243	0	100.0%	243	0	100.0%
Porter	252		266	-14	105.6%	252	0	100.0%	252	0	100.0%	252	0	100.0%
Potomac	1,464		1,185	279	80.9%	1,254	210	85.7%	1,651	-187	112.7%	1,888	-424	129.0%
Reagan	1,233		1,256	-23	101.9%	1,328	-95	107.7%	1,399	-166	113.5%	1,501	-268	121.7%
Rippon	1,390		1,246	144	89.6%	1,343	47	96.6%	1,575	-185	113.3%	1,716	-326	123.4%
Saunders	1,212		1,159	53	95.6%	1,146	66	94.5%	1,183	29	97.6%	1,199	13	98.9%
Stonewall	1,003	5	1,097	-94	109.4%	1,168	-165	116.5%	1,372	-369	136.8%	1,470	-467	146.6%
Woodbridge	1,066	5	1,360	-294	127.6%	1,472	-406	138.1%	1,520	-454	142.6%	1,542	-476	144.7%
Total	20,319 ¹	30	20,095	224	98.9%	20,887	-568	102.8%	22,549	-1,957	109.5%	24,436	-3,844	118.7%
	20,592 ²													

<i>Stonewall MS Addition (17 rooms, 2019)</i>																				357				357			
<i>Middle School (East - Potomac Shores, 2020)</i>																					1,464				1,464		
<i>Middle School (West - Linton Hall Area, 2024)</i>																									1,464		
<i>Middle School (TBD, 2026)</i>																										1,464	
Sum of Additional Seats																						1,821				4,749	
Total	20,319 ¹	30	20,095	224	98.9%	20,887	-568	102.8%	22,549	-136	100.6%	24,436	905	96.4%													
	20,592 ²																										

¹ Planning Capacity on which available space is calculated for the 2016-17 and 2017-18 school years.

² Planning Capacity on which available space is calculated for the 2018-19 through 2026-27 school years. It reflects the 13-classroom addition opening at Lake Ridge MS in 2018-19.

Student Enrollment Data: Current and Projected Enrollment
High Schools
SY 2016-17 to SY 2026-27

High School	Available Space		2016-17			2017-18			2021-22			2026-27														
	Capacity	Portable Classrooms	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util	Students	+/-	% Util												
Battlefield	2,053	14	2,899	-846	141.2%	3,048	-995	148.5%	3,307	-1,254	161.1%	3,300	-1,247	160.8%												
Brentsville	1,110		1,050	60	94.6%	1,029	81	92.7%	1,034	76	93.2%	1,059	51	95.4%												
Colgan	2,053		1,541	555	73.5%	2,191	-96	104.6%	2,557	-462	122.1%	2,349	-254	112.1%												
Forest Park	2,053		2,163	-110	105.4%	2,184	-131	106.4%	2,190	-137	106.7%	2,049	4	99.8%												
Freedom	2,053	4	2,228	-175	108.5%	2,254	-201	109.8%	2,685	-632	130.8%	3,452	-1,399	168.1%												
Gar-Field	2,839		2,515	325	88.6%	2,402	437	84.6%	2,682	157	94.5%	3,178	-339	111.9%												
Hylton	2,053		2,298	-245	111.9%	2,204	-151	107.3%	2,109	-56	102.7%	1,683	370	82.0%												
Osborn Park	2,430		2,278	152	93.7%	2,167	263	89.2%	2,349	81	96.7%	1,916	514	78.8%												
Patriot	2,053	20	2,747	-694	133.8%	2,697	-644	131.4%	2,678	-625	130.4%	2,930	-877	142.7%												
Potomac	2,357		1,995	362	84.6%	2,037	320	86.4%	2,657	-300	112.7%	3,750	-1,393	159.1%												
Stonewall Jackson	2,409	3	2,560	-151	106.3%	2,693	-284	111.8%	3,439	-1,030	142.7%	4,534	-2,125	188.2%												
Woodbridge	2,734		2,651	83	97.0%	2,635	99	96.4%	3,013	-279	110.2%	3,275	-541	119.8%												
Total	26,197	41	26,923	-726	102.8%	27,541	-1,344	105.1%	30,698	-4,501	117.2%	33,475	-7,278	127.8%												
<i>13th High School - (West, 2021)</i>																					2,557				2,557	
<i>14th High School - (Mid-County, 2023)</i>																									2,557	
<i>15th High School - (TBD, 2025)</i>																									2,557	
Sum of Additional Seats																						2,557			7,671	
Total	26,197	41	26,923	-726	102.8%	27,541	-1,344	105.1%	30,698	-1,944	106.8%	33,475	393	98.8%												

Student Enrollment Data: Current Enrollment
Special Education and Alternative Schools
SY 2016-17

Special Education and Alternative School	2016-17	
	Portable Classrooms	Students
PACE East SE		87
PACE West SE		88
Pre-School Child Find		95
School Based Pre-K		410
Woodbine SE	1	61
New Directions Alt		471
New Dominion Alt	11	52
TJHS Regional Magnet		69
Total	12	1,333

Independence Nontraditional School (2018)

Portable Classrooms: Current and Historical Totals
By School Type, 1998 to 2016

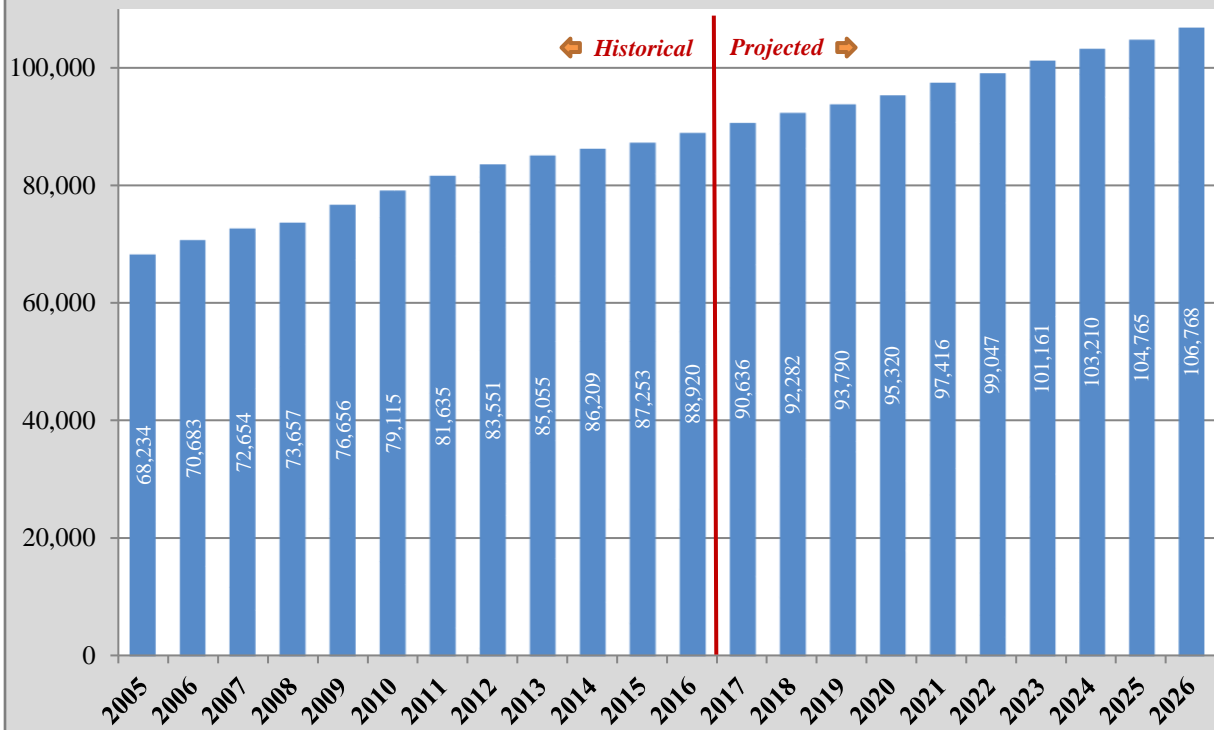
Year	Elementary	Middle	High	Alternative	Special Education	Total
1998	101	21	28	0	5	155
1999	109	25	25	0	5	164
2000	118	31	5	10	5	169
2001	122	37	2	10	5	176
2002	130	26	2	10	5	173
2003	141	16	2	10	5	174
2004	168	19	2	10	5	204
2005	185	40	5	10	5	245
2006	179	27	8	10	5	229
2007	184	20	14	10	10	238
2008	171	20	21	10	10	232
2009	150	21	36	10	7	224
2010	145	21	37	10	10	223
2011	132	31	21	10	10	204
2012	136	29	18	10	9	202
2013	126	23	30	11	9	199
2014	121	22	37	11	9	200
2015	122	27	46	11	9	215
2016	128	30	41	11	1	211

Note: Portable classrooms used for instructional purposes.

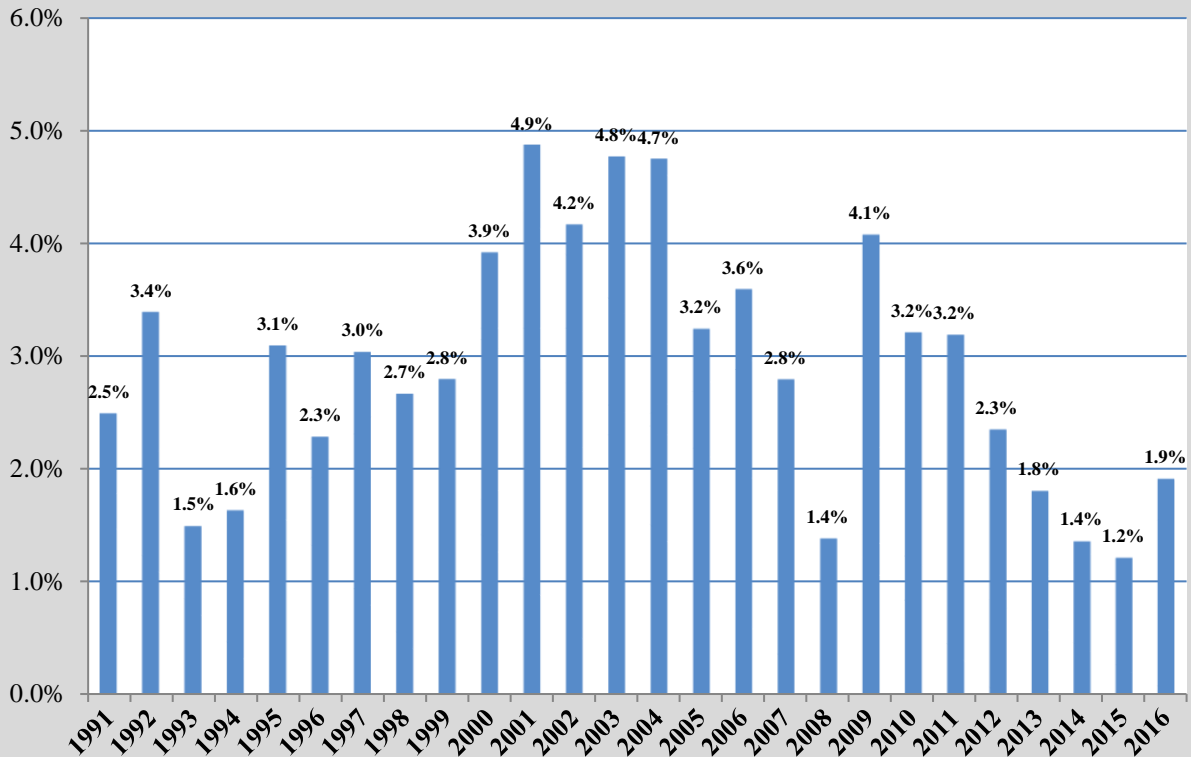
Student Enrollment Data: Historical and Projected 1966-2026

Year	School Type				Total	Annual Change	
	Elementary	Middle	High	Special Education		Number	Percentage
1966	11,361	5,242	4,511	133	21,247		
1967	11,782	5,843	4,991	83	22,699	1,452	6.8%
1968	13,083	6,488	5,641	97	25,309	2,610	11.5%
1969	14,266	7,164	6,496	97	28,023	2,714	10.7%
1970	15,377	7,873	7,008	106	30,364	2,341	8.4%
1971	15,794	8,368	8,053	107	32,322	1,958	6.4%
1972	15,975	8,738	8,741	107	33,561	1,239	3.8%
1973	16,583	9,498	9,464	80	35,625	2,064	6.1%
1974	19,462	9,865	10,338	148	39,813	4,188	11.8%
1975	19,538	10,261	10,800	201	40,800	987	2.5%
1976	18,693	9,799	10,277	238	39,007	-1,793	-4.4%
1977	16,626	9,041	10,463	309	36,439	-2,568	-6.6%
1978	15,378	8,466	10,729	273	34,846	-1,593	-4.4%
1979	16,166	8,344	10,918	286	35,714	868	2.5%
1980	15,385	8,465	10,993	310	35,153	-561	-1.6%
1981	15,429	8,757	11,031	367	35,584	431	1.2%
1982	15,141	8,775	10,927	382	35,225	-359	-1.0%
1983	15,334	8,701	11,128	401	35,564	339	1.0%
1984	15,598	8,438	11,464	383	35,883	319	0.9%
1985	16,326	8,273	11,844	447	36,890	1,007	2.8%
1986	17,130	8,414	11,850	526	37,920	1,030	2.8%
1987	18,143	8,460	12,010	611	39,224	1,304	3.4%
1988	19,334	8,730	11,883	703	40,650	1,426	3.6%
1989	20,130	9,060	11,652	692	41,534	884	2.2%
1990	20,702	9,320	11,638	686	42,346	812	2.0%
1991	20,984	9,861	11,846	709	43,400	1,054	2.5%
1992	21,768	10,212	12,178	712	44,870	1,470	3.4%
1993	21,605	10,654	12,501	779	45,539	669	1.5%
1994	21,826	10,733	12,822	900	46,281	742	1.6%
1995	22,473	11,085	13,329	825	47,712	1,431	3.1%
1996	22,886	11,327	13,828	760	48,801	1,089	2.3%
1997	23,529	11,636	14,366	751	50,282	1,481	3.0%
1998	24,044	11,744	14,839	994	51,621	1,339	2.7%
1999	24,690	12,212	15,292	868	53,062	1,441	2.8%
2000	25,653	12,774	16,079	633	55,139	2,077	3.9%
2001	26,814	13,445	16,881	683	57,823	2,684	4.9%
2002	27,717	14,256	17,558	698	60,229	2,406	4.2%
2003	28,820	15,035	18,525	719	63,099	2,870	4.8%
2004	30,101	15,580	19,652	760	66,093	2,994	4.7%
2005	31,286	15,623	20,448	877	68,234	2,141	3.2%
2006	32,704	15,748	21,228	1,003	70,683	2,449	3.6%
2007	33,858	16,040	21,792	964	72,654	1,971	2.8%
2008	34,428	16,273	21,930	1,027	73,657	1,003	1.4%
2009	36,055	17,034	22,328	1,239	76,656	2,999	4.1%
2010	37,261	17,700	22,857	1,298	79,115	2,459	3.2%
2011	38,436	18,351	23,500	1,348	81,635	2,520	3.2%
2012	39,269	18,902	24,015	1,365	83,551	1,916	2.3%
2013	39,538	19,473	24,665	1,379	85,055	1,504	1.8%
2014	39,920	19,703	25,249	1,337	86,209	1,154	1.4%
2015	40,070	20,004	25,861	1,319	87,253	1,044	1.2%
2016	40,569	20,095	26,923	1,333	88,920	1,667	1.9%
2017	40,869	20,887	27,541	1,339	90,636	1,716	1.9%
2018	41,153	21,550	28,223	1,356	92,282	1,646	1.8%
2019	41,600	22,109	28,710	1,371	93,790	1,508	1.6%
2020	42,060	22,411	29,459	1,390	95,320	1,530	1.6%
2021	42,757	22,549	30,698	1,412	97,416	2,095	2.2%
2022	43,504	22,788	31,323	1,431	99,047	1,632	1.7%
2023	44,453	23,012	32,241	1,454	101,161	2,114	2.1%
2024	45,480	23,479	32,771	1,480	103,210	2,049	2.0%
2025	46,339	23,944	32,983	1,499	104,765	1,555	1.5%
2026	47,337	24,436	33,475	1,520	106,768	2,003	1.9%

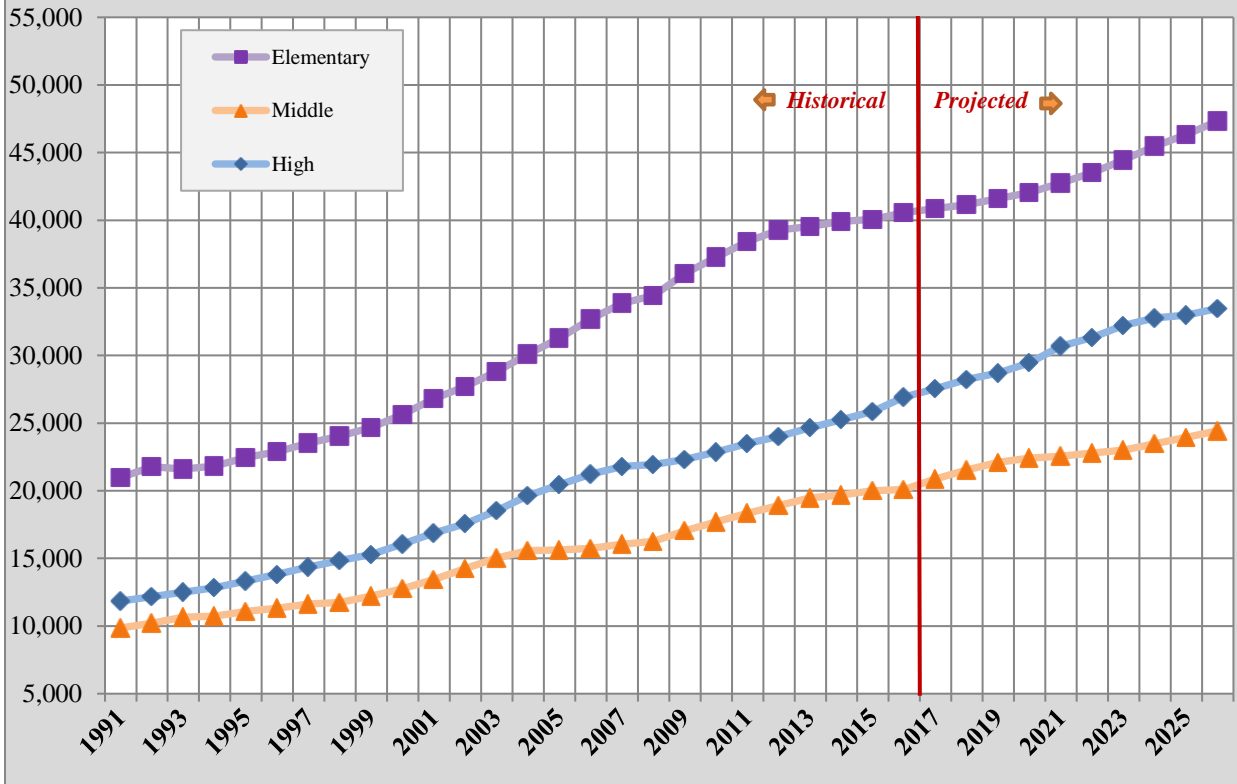
Prince William County Public Schools Historical and Projected Enrollment



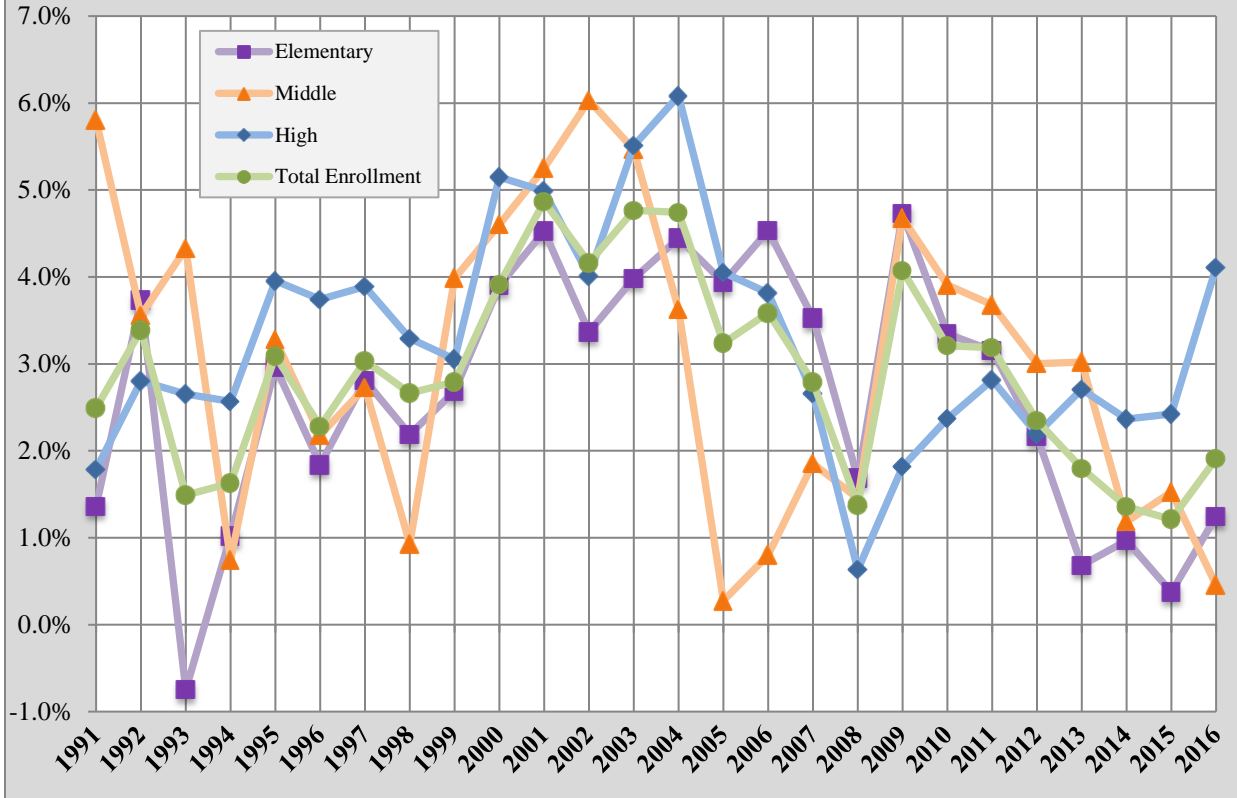
Prince William County Public Schools Annual Percentage Change in Enrollment



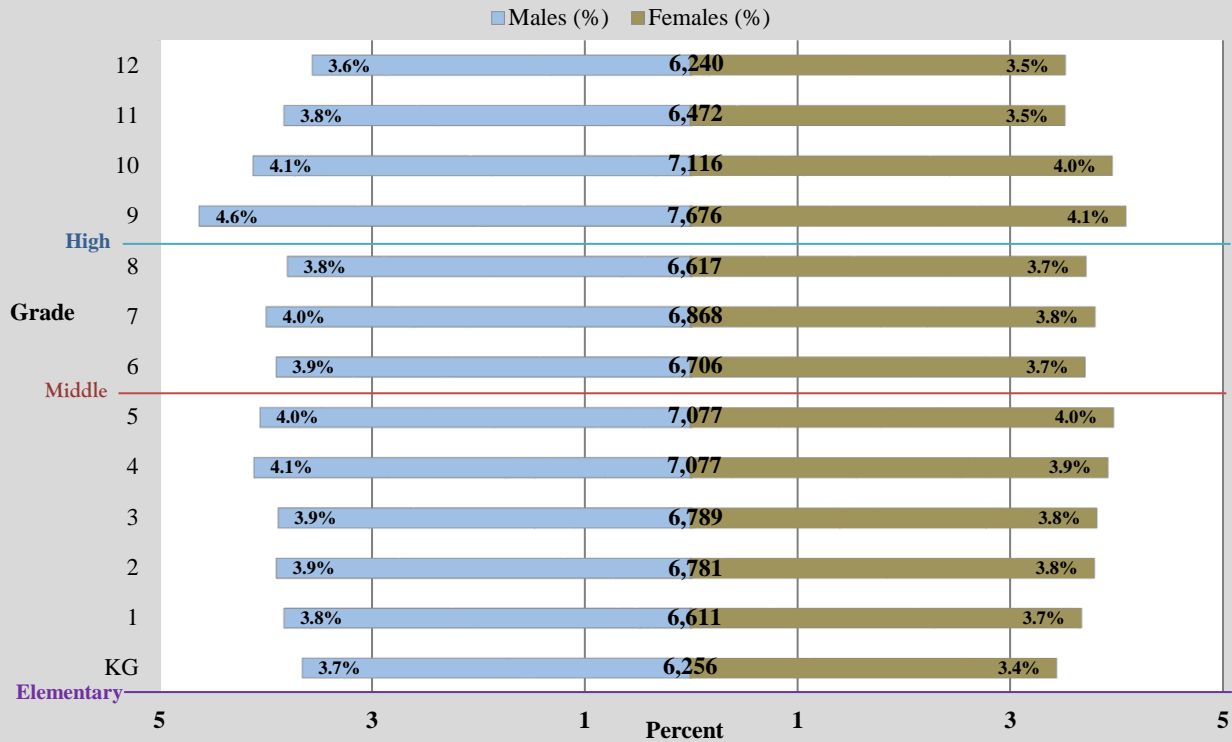
Prince William County Public Schools Historical and Projected Enrollment by School Level



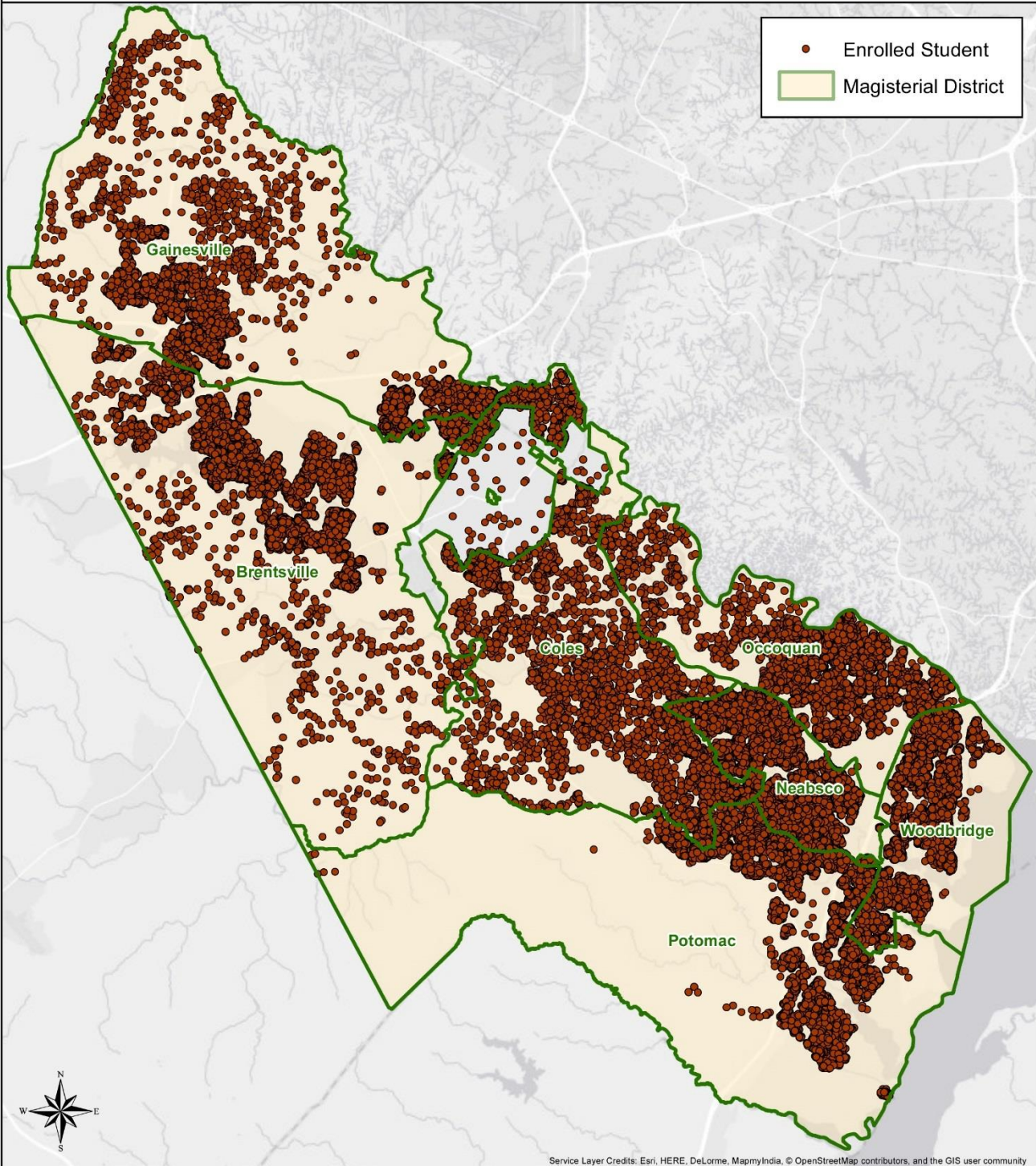
Prince William County Public Schools Annual Percentage Change in Enrollment by School Level



Prince William County Public Schools Grade-Gender Distribution



Source: September 30, 2016, PWCS Students



Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Data:
 Centerlines.shp (12/16)
 12_15_16_GeocodedStudents.shp
 MagDist11_Poly.shp



Document Path: C:\Users\BoydRD\Documents\ArcGIS\Working\2016 Data Requests\CIP Backup Information\Student Distribution 2016-17.mxd

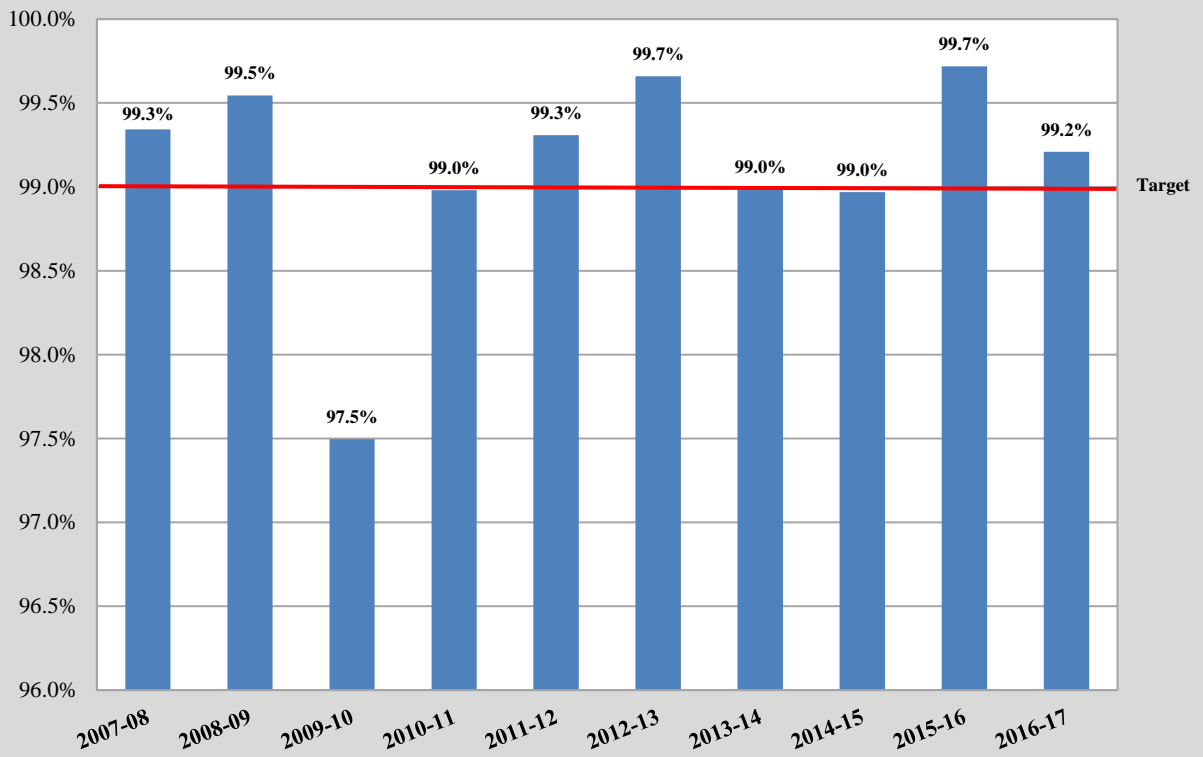
Prepared by Robert Boyd, GIS Analyst I
 Prince William County Public Schools
 Office of Facilities Services
 December 2016

Student Enrollment Projections Error Rate Analysis

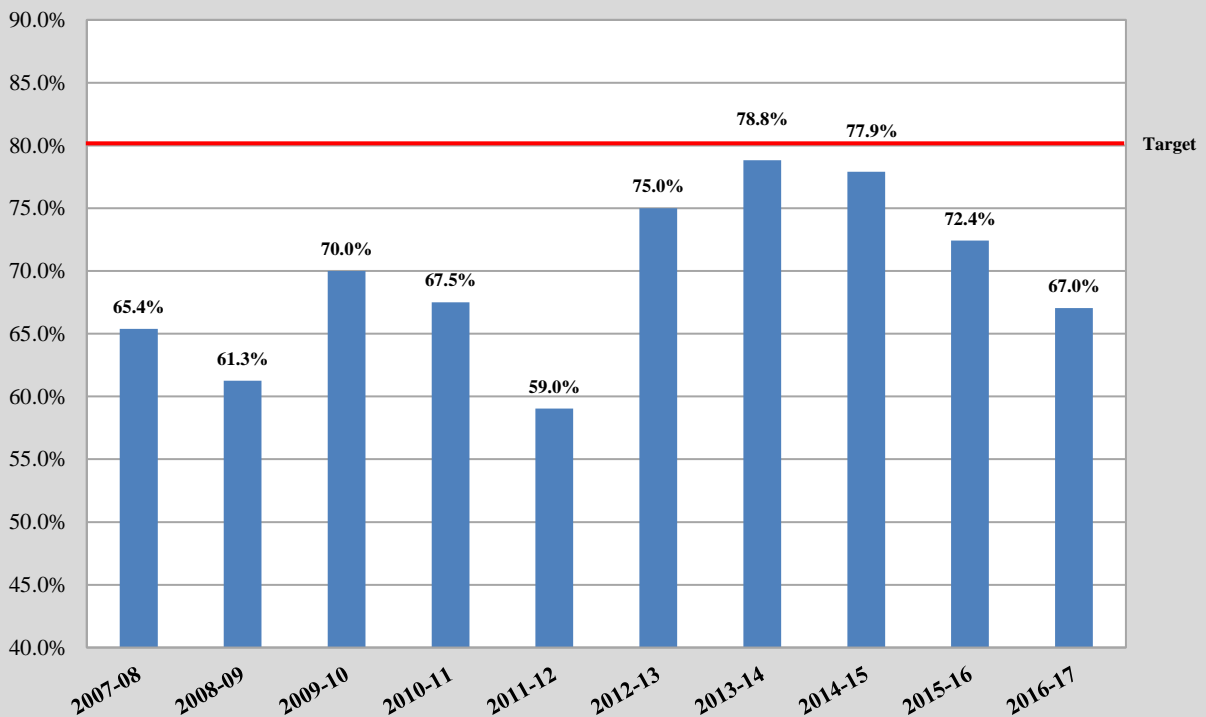
School Year	Actual Student Enrollment	Student Enrollment Projections								
		One Year Before			Two Years Before		Four Years Before		Five Years Before	
		Projection	Difference	% Error *	Projection	% Error *	Projection	% Error *	Projection	% Error *
1984-85	35,864	36,046	182	-0.50%	35,215	1.84%	35,002	2.46%	34,672	3.44%
1985-86	36,836	36,250	(586)	1.62%	35,228	4.56%	35,570	3.56%	35,408	4.03%
1986-87	37,825	37,568	(257)	0.68%	36,713	3.03%	35,484	6.60%	35,977	5.14%
1987-88	39,106	38,830	(276)	0.71%	37,418	4.51%	37,056	5.53%	35,844	9.10%
1988-89	40,463	40,236	(227)	0.56%	39,586	2.22%	37,995	6.50%	37,669	7.42%
1989-90	41,673	42,059	386	-0.92%	41,511	0.39%	40,369	3.23%	38,836	7.31%
1990-91	42,176	42,268	92	-0.22%	42,984	-1.88%	42,565	-0.91%	41,163	2.46%
1991-92	43,400	42,769	(631)	1.48%	45,230	-4.05%	44,223	-1.86%	43,656	-0.59%
1992-93	44,868	44,697	(171)	0.38%	45,156	-0.64%	47,149	-4.84%	45,497	-1.38%
1993-94	45,539	45,762	223	-0.49%	45,618	-0.17%	46,839	-2.78%	47,980	-5.09%
1994-95	46,281	46,436	155	-0.33%	48,523	-4.62%	47,551	-2.67%	48,645	-4.86%
1995-96	47,712	47,162	(550)	1.17%	47,255	0.97%	50,589	-5.69%	49,543	-3.70%
1996-97	48,041	47,991	(50)	0.10%	46,928	2.37%	49,765	-3.46%	50,738	-5.32%
1997-98	49,531	48,939	(592)	1.21%	49,033	1.02%	54,650	-9.37%	52,475	-5.61%
1998-99	50,627	50,785	158	-0.31%	49,865	1.53%	48,731	3.89%	50,746	-0.23%
1999-00	53,062	52,546	(516)	0.98%	53,102	-0.08%	52,567	0.94%	51,330	3.37%
2000-01	55,139	54,269	(870)	1.60%	53,352	3.35%	53,038	3.96%	53,831	2.43%
2001-02	57,823	57,026	(797)	1.40%	55,763	3.69%	54,788	5.54%	54,930	5.27%
2002-03	60,229	59,916	(313)	0.52%	58,829	2.38%	55,688	8.15%	57,231	5.24%
2003-04	63,109	62,391	(718)	1.15%	61,962	1.85%	58,059	8.70%	57,541	9.68%
2004-05	66,093	65,721	(372)	0.57%	64,321	2.75%	62,185	6.28%	59,639	10.82%
2005-06	68,234	68,988	754	-1.09%	68,181	0.08%	64,709	5.45%	63,717	7.09%
2006-07	70,683	70,211	(472)	0.67%	71,511	-1.16%	67,804	4.25%	66,393	6.46%
2007-08	72,654	72,187	(467)	0.65%	71,866	1.10%	71,555	1.54%	69,488	4.56%
2008-09	73,657	73,321	(336)	0.46%	73,592	0.09%	75,914	-2.97%	74,270	-0.83%
2009-10	76,656	74,736	(1,920)	2.57%	75,393	1.68%	74,840	2.43%	77,888	-1.58%
2010-11	79,115	78,308	(807)	1.03%	75,996	4.10%	75,226	5.17%	75,433	4.88%
2011-12	81,635	81,070	(565)	0.70%	79,866	2.21%	77,238	5.69%	76,766	6.34%
2012-13	83,551	83,837	286	-0.34%	82,941	0.74%	79,079	5.66%	80,203	4.17%
2013-14	85,055	85,926	871	-1.01%	86,191	-1.32%	83,659	1.67%	80,801	5.26%
2014-15	86,209	87,108	899	-1.03%	88,420	-2.50%	86,614	-0.47%	85,436	0.90%
2015-16	87,253	87,500	247	-0.28%	89,458	-2.46%	90,898	-4.01%	88,440	-1.34%
2016-17	88,920	88,216	(704)	0.80%	88,777	0.16%	92,957	-4.34%	93,026	-4.41%
(MPE) Mean Percentage Error				0.44%		0.84%		1.63%		2.44%
(MAPE) Mean Absolute Percentage Error				0.83%		1.98%		4.26%		4.55%
10-Year (MPE) Mean Percentage Error				0.38%		0.24%		1.33%		2.22%
10-Year (MAPE) Mean Absolute Percentage Error				0.87%		1.59%		3.47%		3.70%

*A negative forecast error indicates that the projection was greater than the actual value.

Prince William County Public Schools
Divisionwide Projection Accuracy



Prince William County Public Schools
Percentage of Schools Within 5% Error



Housing Units in Residential Development
By Elementary School Attendance Area and Stage of Development
September 2016

Elementary School	Active				Planned				Rezoning Submitted				Total
	SF	TH	MF	Total	SF	TH	MF	Total	SF	TH	MF	Total	
Alvey	141			141									141
Ashland	6			6	65			65					71
Belmont							720	720			1,522	1,522	2,242
Bennett	10	239		249	153	258		411					660
Bristow Run					4			4	34	39		73	77
Buckland Mills		139	16	155		106		106	384	130		514	775
Coles	29			29	21			21					50
Covington-Harper	282	215	58	555	890	800	1,550	3,240			170	170	3,965
Dale City					4			4					4
Dumfries	5		98	103					13			13	116
Ellis									270	365	1,601	2,236	2,236
Featherstone					11			11					11
Fitzgerald			804	804		398		398	18		192	210	1,412
Glenkirk	11			11	4			4					15
Gravelly	324			324	35			35					359
Haymarket	109	219	216	544	231			231		87	36	123	898
Henderson	143			143	38			38					181
Kilby							148	148		225	827	1,052	1,200
King	137			137									137
Leesylvania		50		50			550	550					600
Loch Lomond		102	40	142									142
Marshall	12			12	5			5	52			52	69
Marumscow Hills		24	101	125		25		25		10	12	22	172
McAuliffe		4		4									4
Minnieville											144	144	144
Montclair					7			7	47			47	54
Mountain View	11			11					299			299	310
Mullen							20	20			788	788	808
Neabsco		36		36									36
Nokesville School, The	315			315	122			122	1,076			1,076	1,513
Occoquan			20	20	21			21					41
Old Bridge					4			4					4
Parks					11			11	10			10	21
Penn	231	12		243	15			15	12	167		179	437
Piney Branch	48	56	77	181							80	80	261
River Oaks										112		112	112
Rockledge							216	216					216
Signal Hill	56	90	296	442	245	180	54	479	288	279		567	1,488
Swans Creek			88	88			73	73	16		135	151	312
Triangle	54	12		66	49			49					115
Tyler			19	19			86	86		97	118	215	320
Vaughan			201	201	139			139	17			17	357
Victory		23	648	671									671
Westridge	20			20									20
Williams	54			54							162	162	216
Wilson	51		10	61	29	30	163	222	39			39	322
Wood	18			18					10	139		149	167
Yorkshire	10		461	471	12			12					483
Yung	86			86	177	255		432	650	2,200	1,106	3,956	4,474
Total	2,163	1,221	3,153	6,537	2,292	2,052	3,580	7,924	3,235	3,850	6,893	13,978	28,439

Note:

Active = Rezoning approved by Board of County Supervisors and site development permit issued
Planned = Rezoning approved by Board of County Supervisors and proposed plans submitted
Rezoning Submitted = rezoning application submitted, CPA request submitted or initiated (if applicable), or no recent progress has occurred
Schools without additional residential development within their respective attendance areas are omitted

* The boundaries for elementary school analysis are the approved 2017-18 boundaries

Housing Units in Residential Development
By Middle School Attendance Area and Stage of Development
September 2016

Middle School	Active				Planned				Rezoning Submitted				Total
	SF	TH	MF	Total	SF	TH	MF	Total	SF	TH	MF	Total	
Benton	281	12		293	135			135	64			64	492
Beville	137			137						167		167	304
Bull Run	31		19	50	160	255	86	501	299	1,097	424	1,820	2,371
Gainesville	145	56	725	926	25			25	650	1,200	880	2,730	3,681
Graham Park	59	12	98	169	49			49	13			13	231
Hampton		36	10	46	4	30	163	197					243
Lynn		24	322	346	21	25	868	914		235	2,361	2,596	3,856
Marsteller	18	23		41			20	20	44	543	2,389	2,976	3,037
Nokesville School, The	315			315	122			122	1,076			1,076	1,513
Parkside	76	431	797	1,304	410	438	54	902	558	279		837	3,043
Potomac	336	265	146	747	890	800	1,623	3,313	16	112	467	595	4,655
Reagan	554	358	232	1,144	266	106		372	384	217	36	637	2,153
Rippon	143		804	947	49	398	550	997	18		192	210	2,154
Saunders	48	4		52	18			18	96				166
Woodbridge	20			20	143		216	359	17		144	161	540
Total	2,163	1,221	3,153	6,537	2,292	2,052	3,580	7,924	3,235	3,850	6,893	13,978	28,439

Note:

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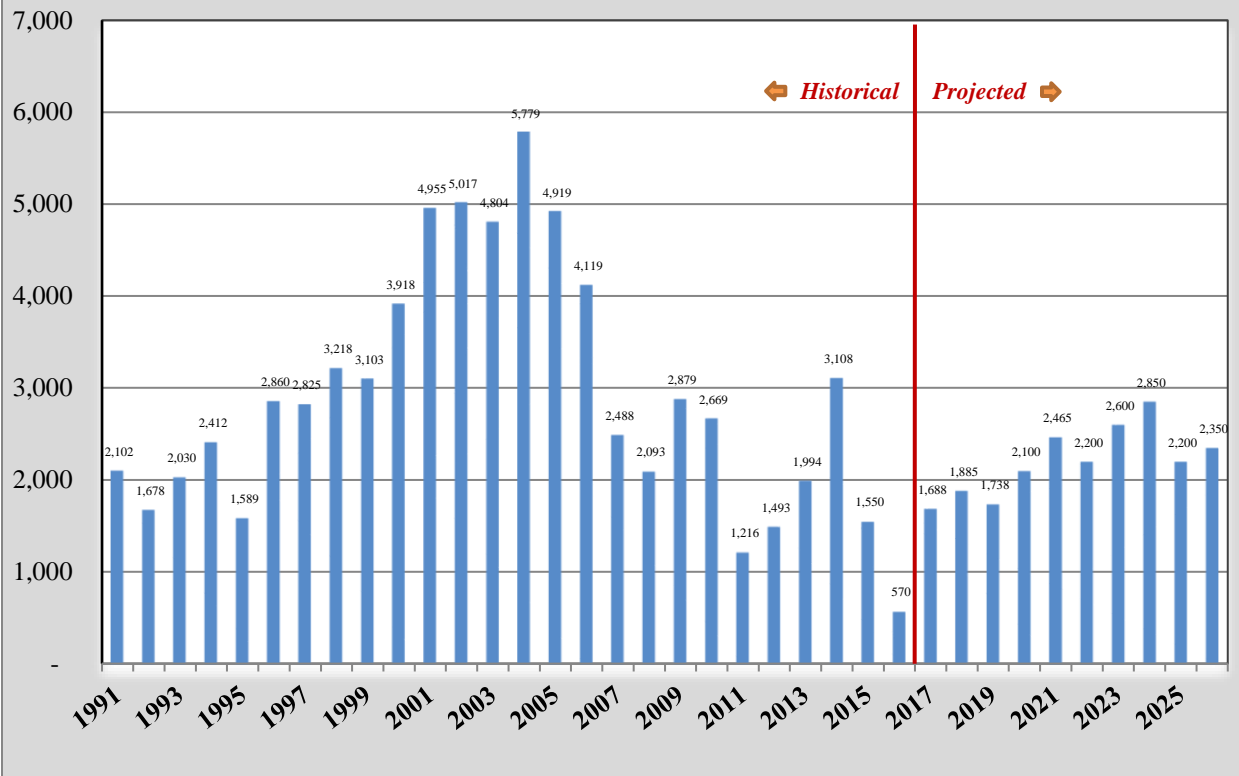
Housing Units in Residential Development
By High School Attendance Area and Stage of Development
September 2016

High School	Active				Planned				Rezoning Submitted				Total
	SF	TH	MF	Total	SF	TH	MF	Total	SF	TH	MF	Total	
Battlefield	585	299	235	1,119	266		86	352	683	1,184	154	2,021	3,492
Brentsville	315			315	161			161	1,076			1,076	1,552
Colgan	412	12		424	120			120	52	167		219	763
Forest Park	11	12	98	121	11			11	13			13	145
Freedom		24	1,106	1,130	11	423	1,418	1,852	18	10	1,726	1,754	4,736
Gar-Field	20	36	10	66	154	30	163	347	17		144	161	574
Hylton	48	4		52	11			11	96			96	159
Osborn Park	76	329	757	1,162	386	438	54	878	300	279		579	2,619
Patriot	29	59	16	104	8	106		114	44	308	80	432	650
Potomac	533	265	146	944	966	800	1,623	3,389	16	112	467	595	4,928
Stonewall Jackson	134	181	765	1,080	177	255	20	452	920	1,565	3,495	5,980	7,512
Woodbridge			20	20	21		216	237		225	827	1,052	1,309
Total	2,163	1,221	3,153	6,537	2,292	2,052	3,580	7,924	3,235	3,850	6,893	13,978	28,439

Note:

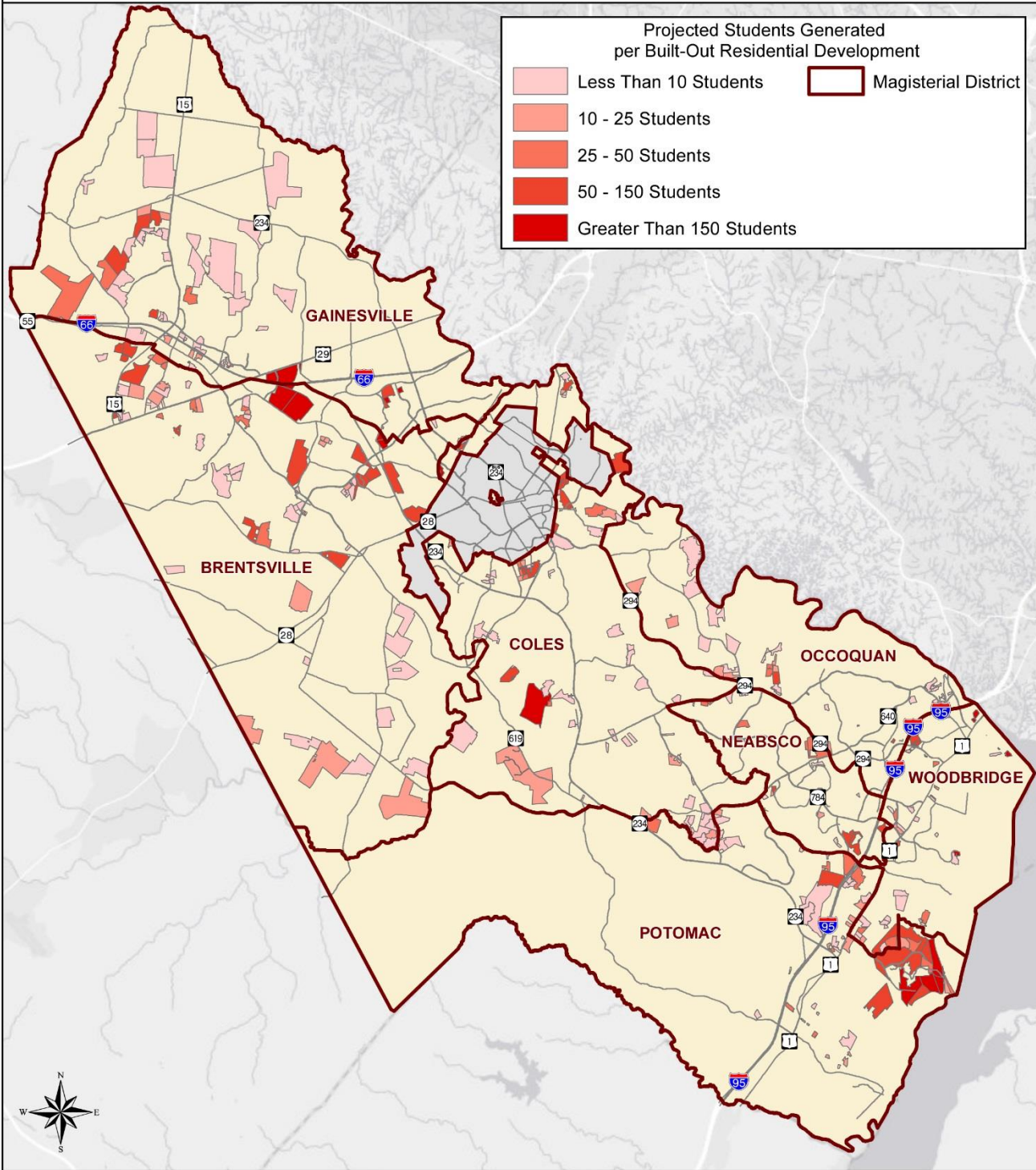
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Prince William County Historical and Projected Annual Housing Unit Change





Additional Students Generated by Residential Development (2017-2026)



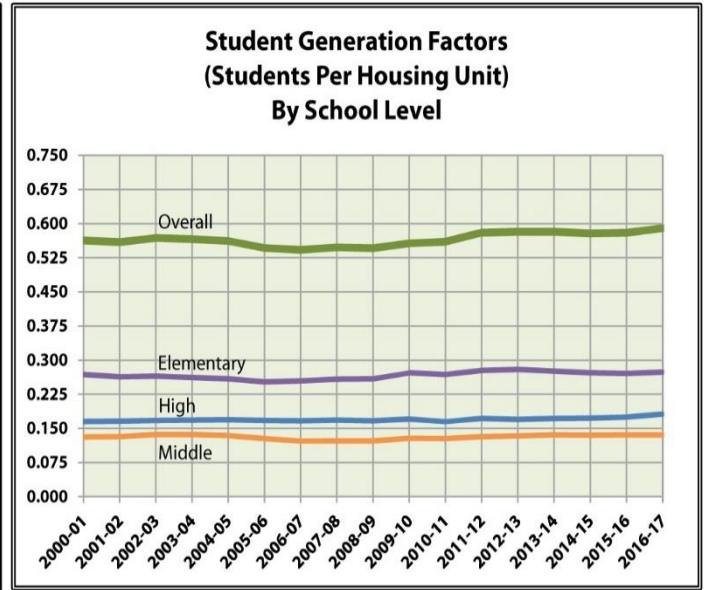
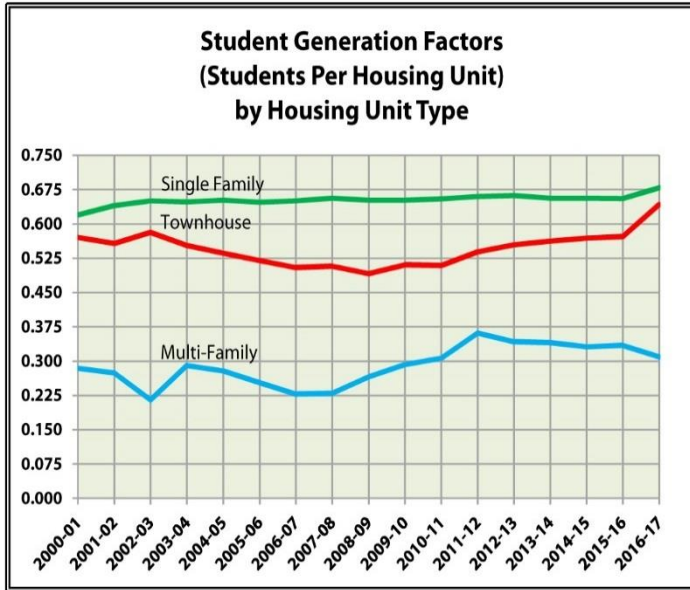
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Prepared By Robert Boyd, GIS Analyst I
 Prince William County Public Schools
 Office of Facilities Services
 December 2016

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Student Generation Factors by School Level and Housing Unit Type

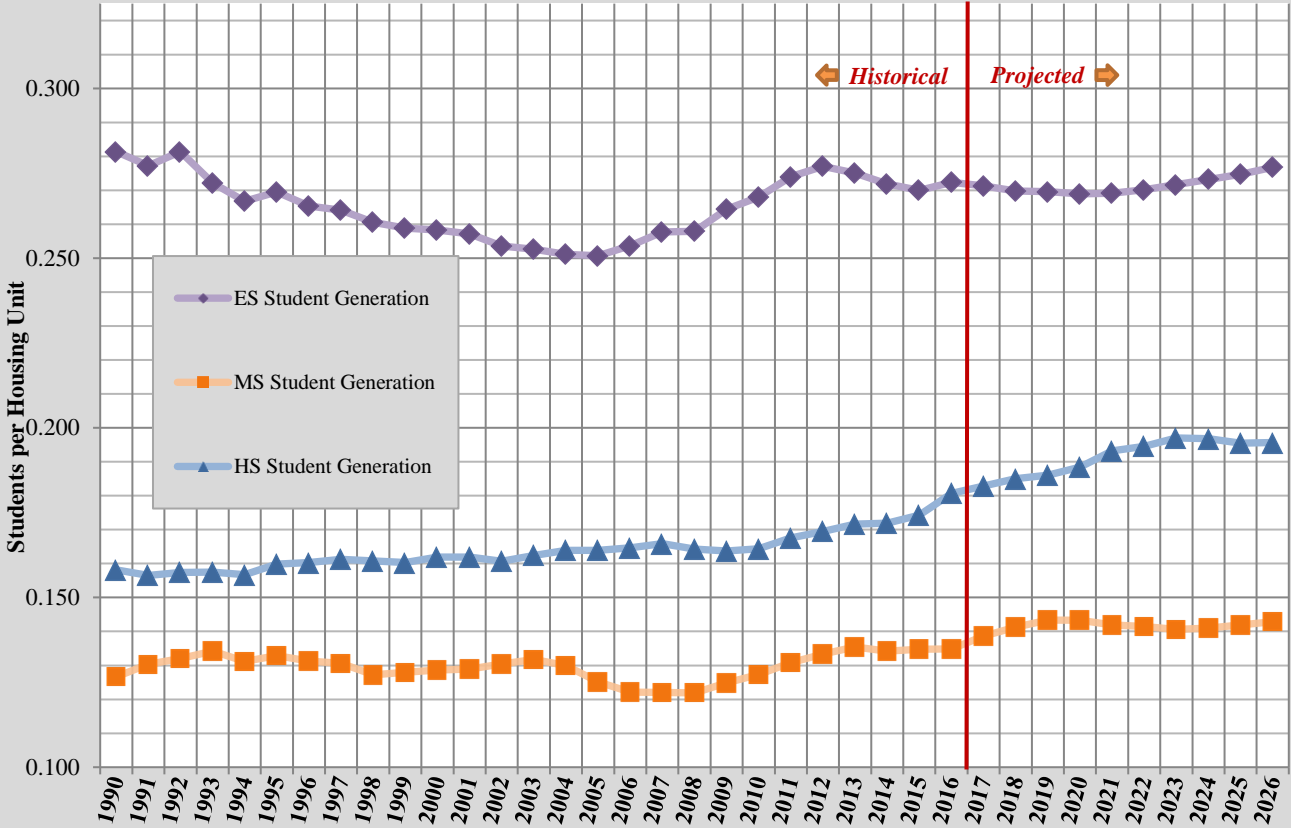


Historical Data											
2016-17	School Type	Unit Type			Total	2008-09	School Type	Unit Type			Total
		Single Family	Townhouse	Multi-Family				Single Family	Townhouse	Multi-Family	
	Elementary	0.300	0.313	0.163	0.273		Elementary	0.298	0.245	0.142	0.258
	Middle	0.159	0.145	0.064	0.135		Middle	0.148	0.107	0.055	0.122
	High	0.220	0.184	0.082	0.181		High	0.206	0.139	0.069	0.166
	Total	0.679	0.642 ¹	0.309 ¹	0.590	Total	0.652	0.491	0.265	0.546	
2014-15	School Type	Unit Type			Total	2006-07	School Type	Unit Type			Total
		Single Family	Townhouse	Multi-Family				Single Family	Townhouse	Multi-Family	
	Elementary	0.294	0.285	0.176	0.272		Elementary	0.294	0.250	0.122	0.254
	Middle	0.156	0.128	0.070	0.134		Middle	0.148	0.111	0.048	0.122
	High	0.206	0.155	0.085	0.172		High	0.208	0.143	0.058	0.166
	Total	0.656	0.569	0.331	0.578	Total	0.650	0.504	0.228	0.542	
2012-13	School Type	Unit Type			Total	2004-05	School Type	Unit Type			Total
		Single Family	Townhouse	Multi-Family				Single Family	Townhouse	Multi-Family	
	Elementary	0.302	0.287	0.184	0.279		Elementary	0.290	0.257	0.150	0.258
	Middle	0.156	0.120	0.075	0.133		Middle	0.157	0.128	0.062	0.134
	High	0.205	0.147	0.083	0.169		High	0.206	0.151	0.065	0.169
	Total	0.662	0.554	0.342	0.582	Total	0.652	0.536	0.278	0.561	
2010-11	School Type	Unit Type			Total	2002-03	School Type	Unit Type			Total
		Single Family	Townhouse	Multi-Family				Single Family	Townhouse	Multi-Family	
	Elementary	0.301	0.258	0.167	0.268		Elementary	0.288	0.288	0.124	0.264
	Middle	0.152	0.111	0.067	0.127		Middle	0.159	0.137	0.045	0.136
	High	0.202	0.139	0.072	0.164		High	0.203	0.156	0.047	0.167
	Total	0.655	0.509	0.306	0.560	Total	0.650	0.581	0.215	0.568	

Note: The 'Student Generation Factor' is a mathematical representation of the relationship between housing units in Prince William County and the number of students enrolled in Prince William County Public Schools on September 30 of each year. In other words, it is the number of enrolled students per total number of housing units by type.

¹ Approximately 7,000 condo-style townhouses and 2-over-2 units were reclassified from townhouse to multi-family, thus contributing to a notable increase in student yields of townhouse units and a decrease in student yields of multi-family units.

Prince William County Public Schools
Student Generation Factors by School Level



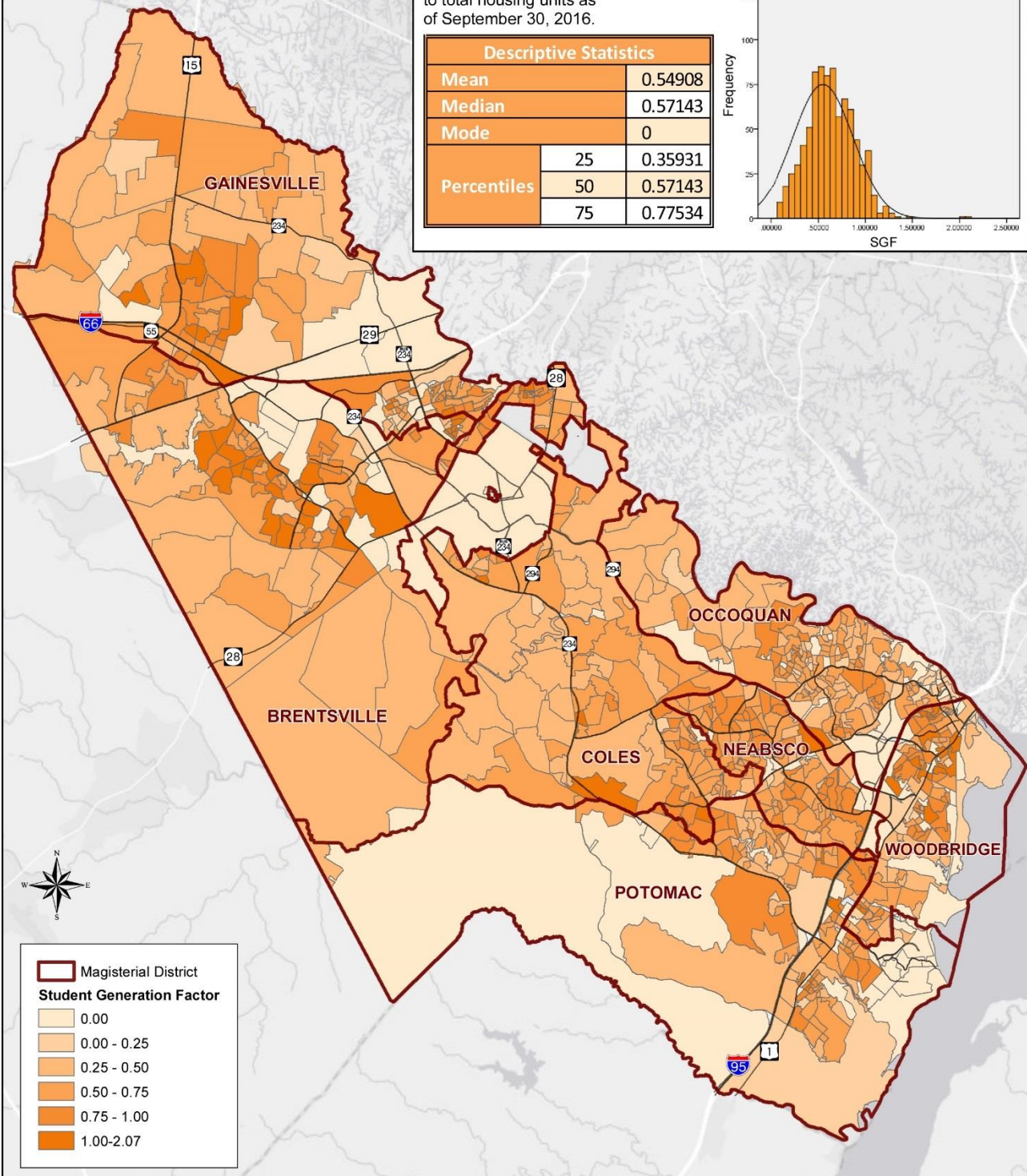
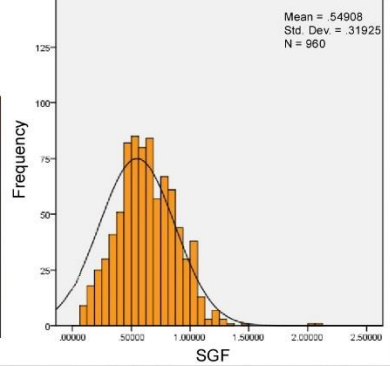


2016-17 Student Generation Factor by Planning Zone

Student Generation Factor (SGF):
Ratio of enrolled students
to total housing units as
of September 30, 2016.

Descriptive Statistics		
Mean	0.54908	
Median	0.57143	
Mode	0	
Percentiles	25	0.35931
	50	0.57143
	75	0.77534

Student Generation Factor Distribution



	Magisterial District
Student Generation Factor	
	0.00
	0.00 - 0.25
	0.25 - 0.50
	0.50 - 0.75
	0.75 - 1.00
	1.00-2.07

Data Sources:
MagDist11_Poly.shp
PZ_SGF_1617.dbf

PZ16a.shp



Document Path: C:\Users\BoydRD\Documents\ArcGIS\Working\2017 Data Requests\2016-17 SGF by Planning Zone\2016-17 SGF by Planning Zone.mxd

Prepared by Robert D Boyd, GIS Analyst I
Prince William County Public Schools
Office of Facilities Services
March 2017

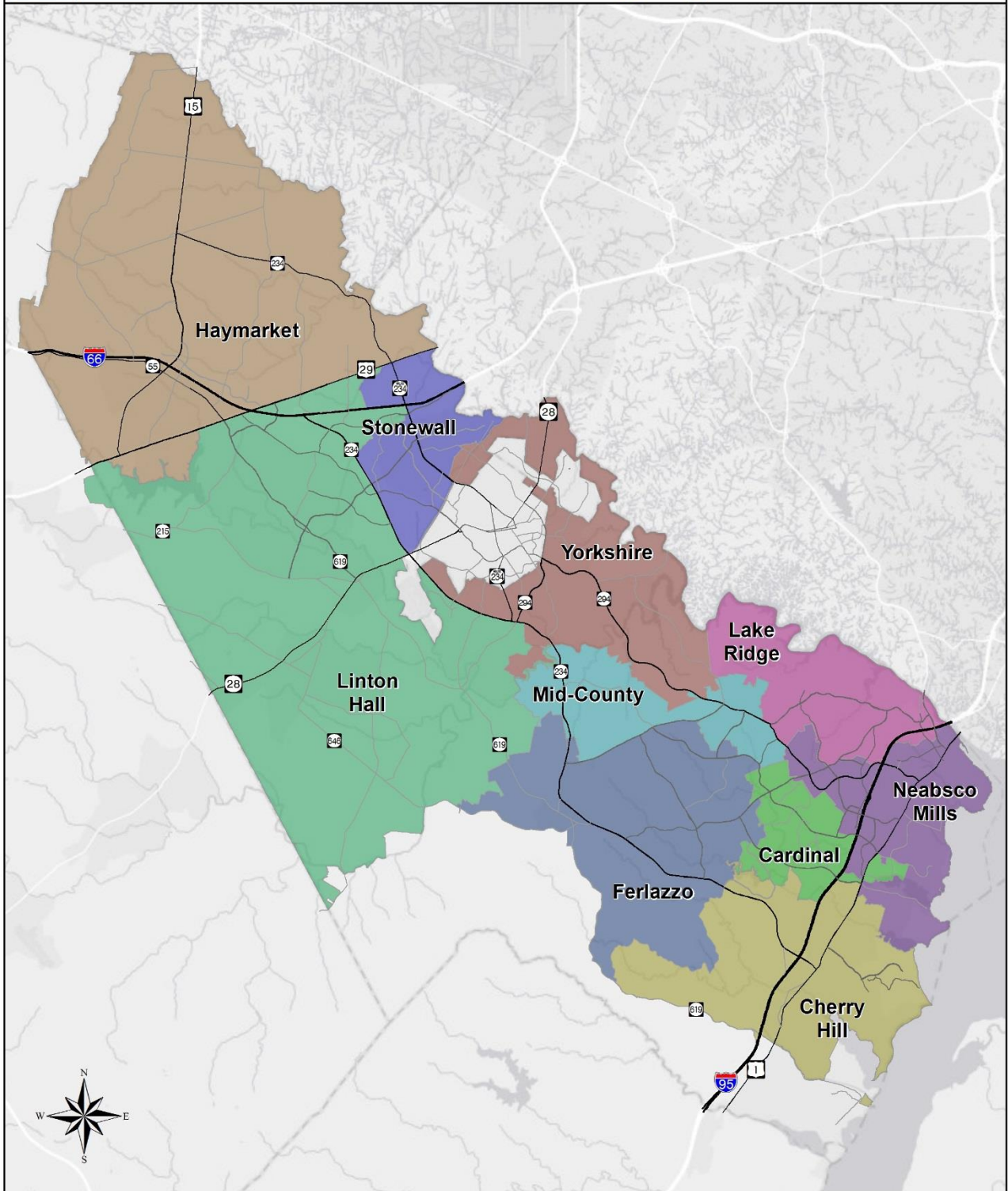
Elementary Schools
By CIP Geographic Areas

Geographic Area	Schools
Cardinal Area	Bel Air ES
	Dale City ES
	Fitzgerald ES
	Henderson ES
	Minnieville ES
	Neabsco ES
Cherry Hill Area	Covington-Harper ES
	Dumfries ES
	Pattie ES
	River Oaks ES
	Swans Creek ES
	Triangle ES
	Williams ES
Ferlazzo Area	Ashland ES
	Coles ES
	Enterprise ES
	King ES
	McAuliffe ES
	Montclair ES
	Parks ES
	Wilson ES
Haymarket Area	Alvey ES
	Buckland Mills ES
	Gravelly ES
	Haymarket ES
	Mountain View ES
	Tyler ES
Lake Ridge Area	Antietam ES
	Lake Ridge ES
	Occoquan ES
	Old Bridge ES
	Rockledge ES
	Springwoods ES
	Westridge ES
Linton Hall Area	Bristow Run ES
	Cedar Point ES
	Glenkirk ES
	Nokesville School, The
	Piney Branch ES
	Victory ES
	Wood ES
	Yung ES

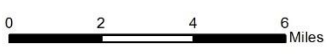
Geographic Area	Schools
Mid-County Area	Kerrydale ES
	Marshall ES
	Penn ES
Neabsco Mills / Northern Route 1	Belmont ES
	Featherstone ES
	Kilby ES
	Leesylvania ES
	Marumsc Hills ES
	Potomac View ES
Stonewall Area	Vaughan ES
	Ellis ES
	Mullen ES
	Sinclair ES
	Sudley ES
Yorkshire Area	West Gate ES
	Bennett ES
	Loch Lomond ES
	Signal Hill ES
	Yorkshire ES



CIP Geographic Areas



Data:
 Centerlines
 CIP_Geog_Area_2017



Prepared By Robert D Boyd, GIS Analyst I
 Prince William County Schools
 Office of Facilities Services
 March 2017

Fall Membership By Virginia School Division

Division Name	Division Membership, PK- Grade 12						Change 2011 to 2016			
	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	Number	Rank in Virginia	Percent	Rank in Virginia
Alexandria City Public Schools	15,418	14,857	14,359	13,723	13,256	12,514	2,904	5	23.2%	1
Arlington County Public Schools	26,176	25,365	24,561	23,500	22,544	21,894	4,282	4	19.6%	5
Charlottesville City Public Schools	4,478	4,382	4,356	4,340	4,236	4,175	303	21	7.3%	17
Chesapeake City Public Schools	40,192	39,944	39,715	39,750	39,644	39,484	708	12	1.8%	32
Chesterfield County Public Schools	60,103	59,705	59,754	59,214	58,886	59,231	872	10	1.5%	36
Culpeper County Public Schools	8,204	8,135	8,079	8,083	7,865	7,812	392	18	5.0%	25
Fairfax County Public Schools	187,510	185,856	185,563	183,438	180,634	177,619	9,891	2	5.6%	21
Falls Church City Public Schools	2,672	2,519	2,465	2,426	2,274	2,183	489	17	22.4%	3
Fauquier County Public Schools	11,078	11,155	11,167	11,147	11,068	11,248	-170	90	-1.5%	57
Fredericksburg City Public Schools	3,581	3,532	3,466	3,457	3,359	3,270	311	20	9.5%	10
Harrisonburg City Public Schools	6,188	5,924	5,635	5,392	5,212	5,051	1,137	9	22.5%	2
Henrico County Public Schools	51,425	51,534	50,972	50,569	50,083	49,654	1,771	6	3.6%	29
Loudoun County Public Schools	78,713	76,251	73,438	70,844	68,253	65,641	13,072	1	19.9%	4
Manassas City Public Schools	7,713	7,605	7,476	7,242	7,276	7,154	559	16	7.8%	14
Manassas Park City Public Schools	3,588	3,443	3,359	3,216	3,123	3,019	569	15	18.8%	6
Prince William County Public Schools	89,378	87,823	86,664	85,476	83,877	81,955	7,423	3	9.1%	11
Spotsylvania County Public Schools	23,617	23,731	23,887	23,838	23,768	23,817	-200	97	-0.8%	51
Stafford County Public Schools	28,679	28,098	27,807	27,461	27,475	27,350	1,329	8	4.9%	26
Virginia Beach City Public Schools	69,085	69,777	70,121	70,556	70,292	70,978	-1,893	133	-2.7%	71
State Totals	1,288,481	1,284,680	1,280,978	1,274,265	1,265,967	1,259,611	25,069		2.0%	

Source: Virginia Department of Education, Fall Membership Report.

Note: Excluded from the September 30 Fall Membership count are special education preschool pupils, pupils in hospitals, clinics or detention homes and local programs such as vocational and alternative education centers (i.e., centers or schools which receive, but do not officially enroll students).

APPENDIX C

Identified Capital Improvement Sites

Identified Capital Improvement Sites

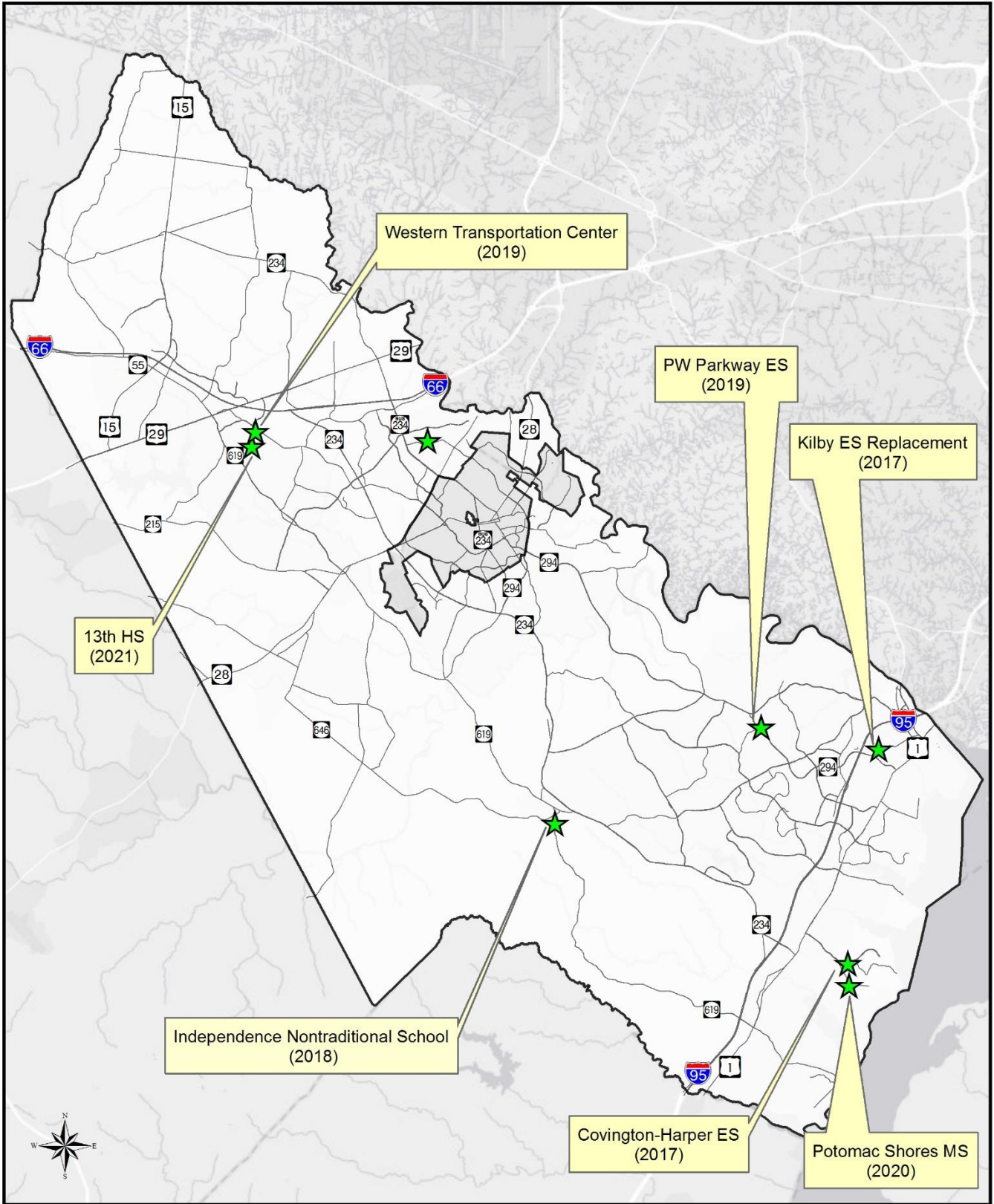
Overall Map of Sites Identified in the Capital Improvements Program

- Covington-Harper Elementary School (2017)
- Kilby Elementary School Replacement (2017)
- Independence Nontraditional School (2018)
- PW Parkway Elementary School (2019)
- Western Transportation Center (2019)
- Potomac Shores Middle School (2020)
- 13th High School (2021)

Capital Improvement Site Maps

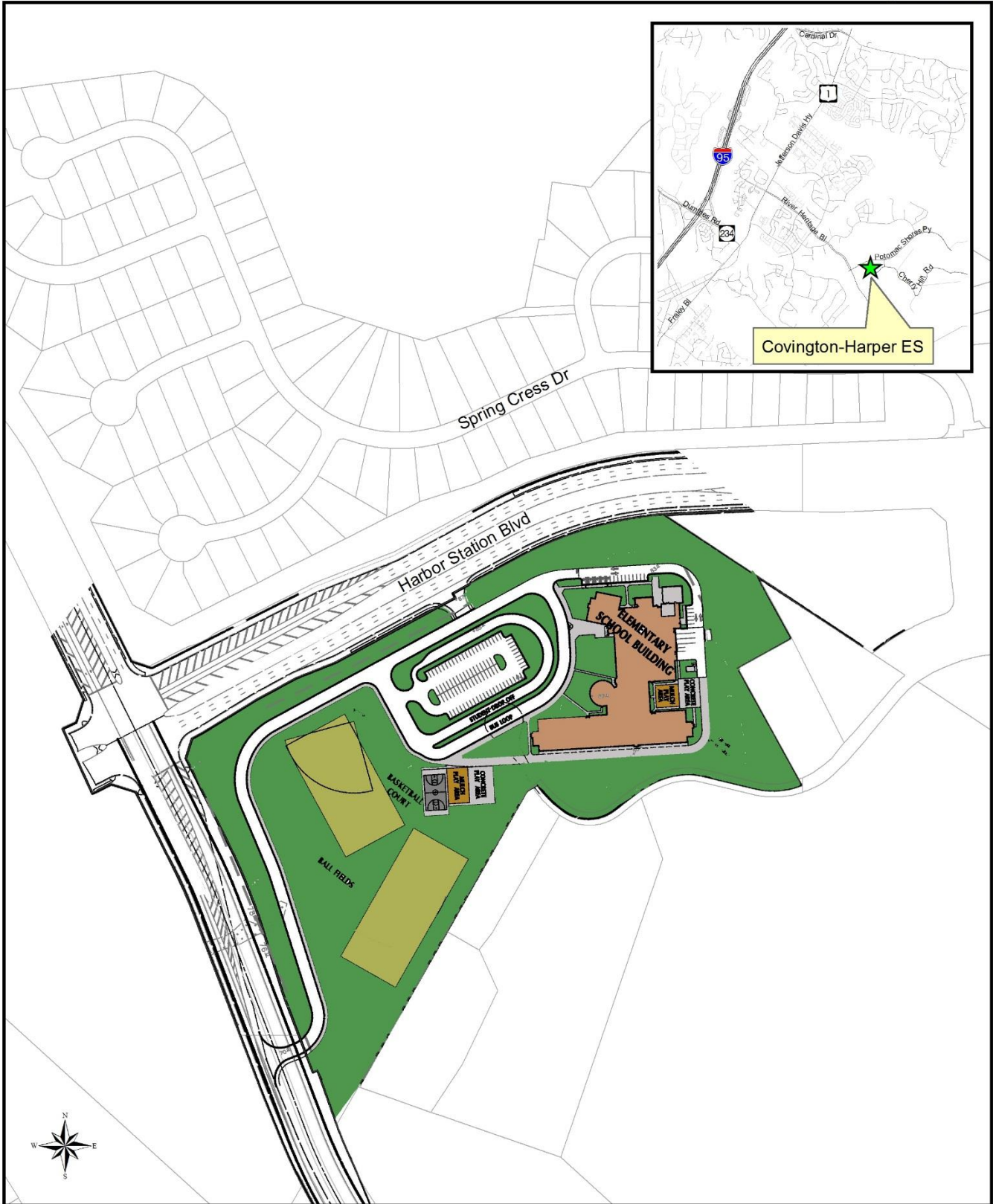
Appendix C details the Capital Improvement sites that have been acquired by the School Division. The year the facilities are scheduled to open at the identified site is shown on the site map and the overall map (C-2)

New School Facilities Identified in the Capital Improvements Program (CIP)



Covington-Harper Elementary School

Opens 2017

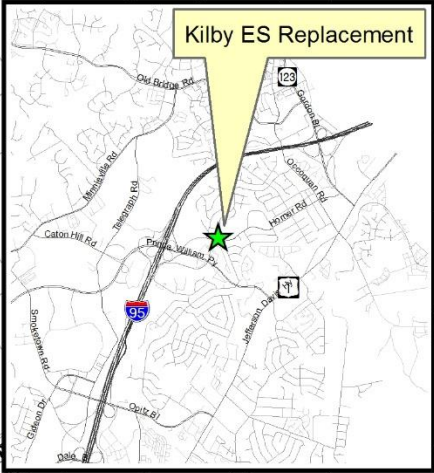
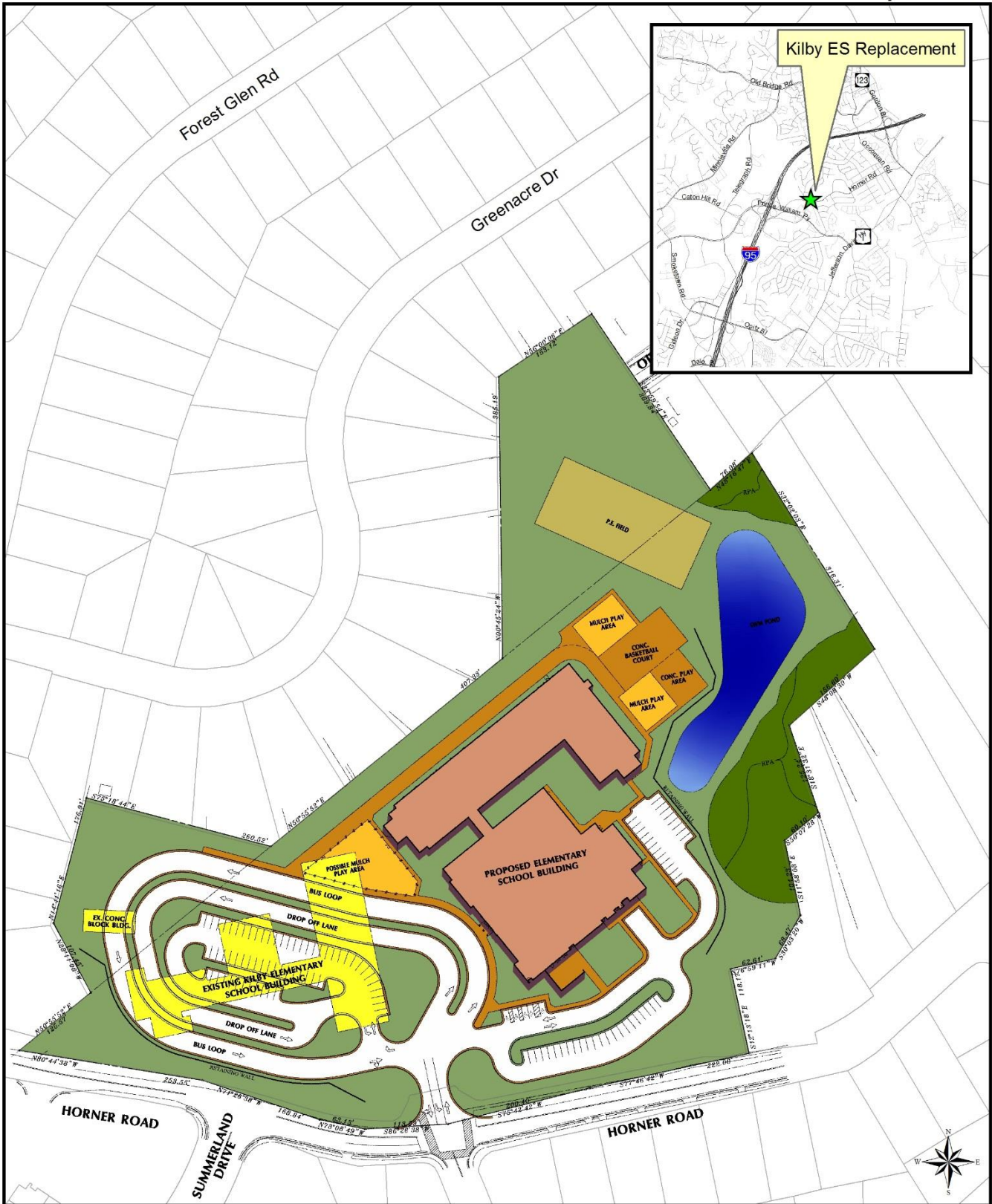


0 0.025 0.05 0.075 0.1 Miles

Office of Facilities Services

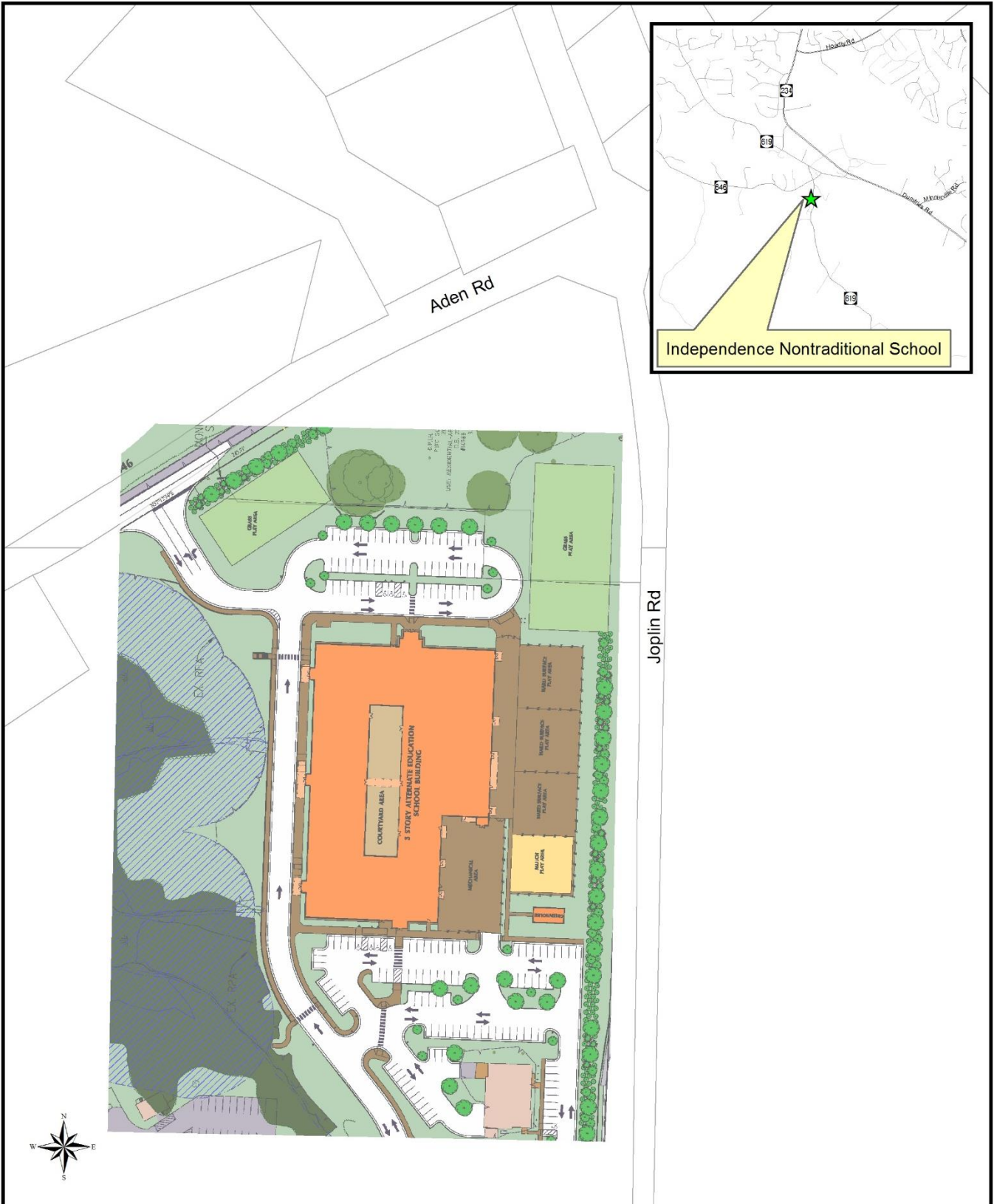
Kilby Elementary School Replacement

Opens 2017



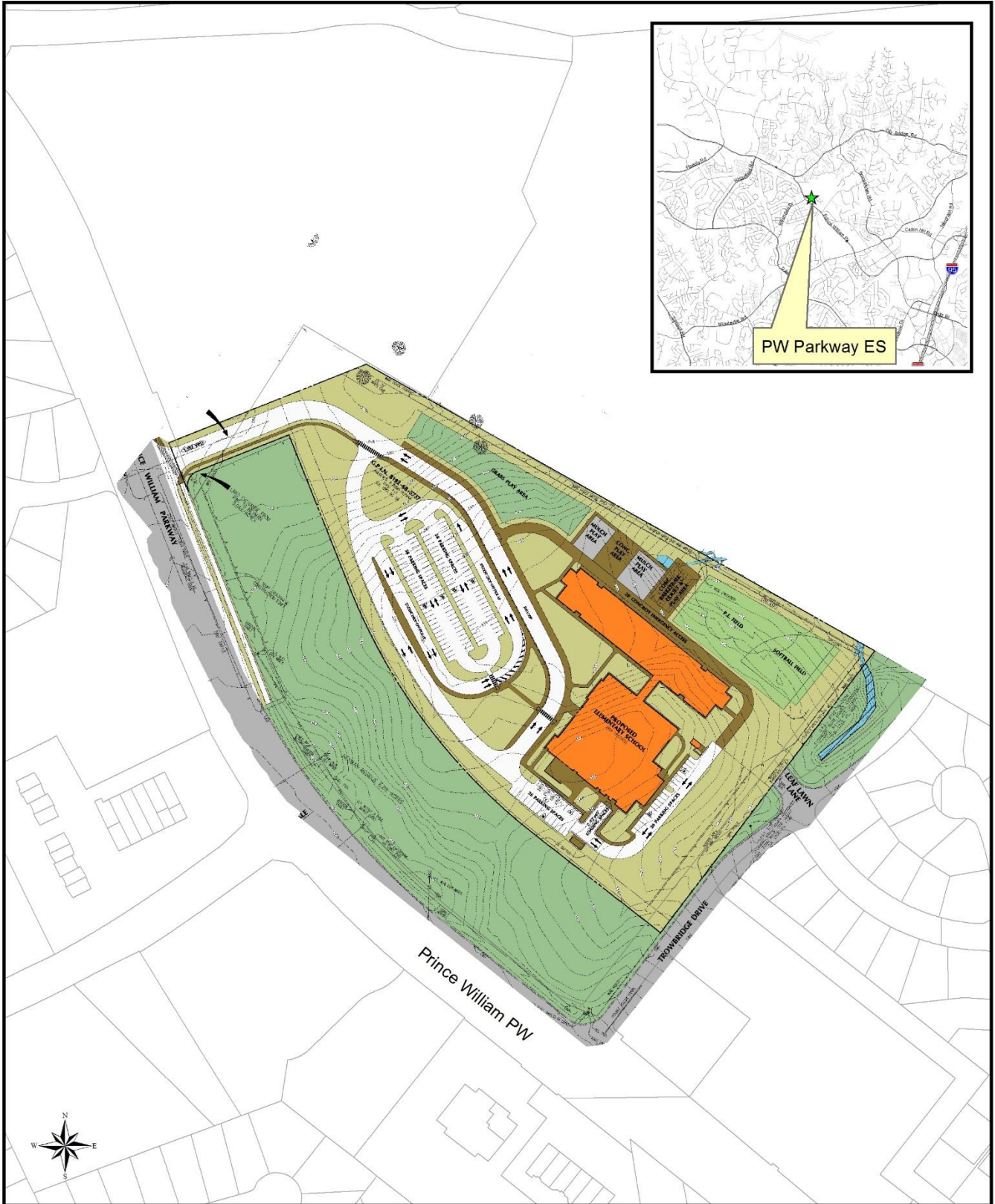
0 0.015 0.03 0.045 0.06 Miles

Office of Facilities Services



0 0.015 0.03 0.045 0.06 Miles

Office of Facilities Services



0 0.02 0.04 0.06 0.08 Miles

Office of Facilities Services



0 0.04 0.08 0.12 0.16 Miles

Office of Facilities Services



0 0.03 0.06 0.09 0.12 Miles

Office of Facilities Services

APPENDIX D

School Construction Financial Data

School Construction Financial Data

- School Construction Projects by Types of Expenditures
- Bond Expenditure Data
- Commonwealth of Virginia Comparative School Construction Cost Data
 - New Elementary Schools
 - New Middle Schools
 - New High Schools
- Elementary School Construction Cost Comparatives

School Construction Projects by Types of Expenditures

School Construction Projects Types of Expenditures FY2012 to FY2017

PWCS Project Name	Opening Date	CIP Construction Project Budget	Construction Expenditures							Total Construction Expenditures	Operating Fund / Start Up Costs ⁷	Site Acquisition Costs ⁸	Total Project Costs
			Construction Contract Bid ¹	Project Costs Outside of Construction Contract					Total Project Costs Outside of Construction Contract				
				Construction Contract Change Order Costs ²	Temporary Employees ³	Engineering Services ⁴	Furnishings & Equipment ⁵	Other Non-Construction Contract Costs ⁶					
Independence Non-Traditional	Sep-18	\$ 35,850,000	\$ 27,180,000	\$ 26,347	\$ 32,061	\$ 1,716,668		\$ 1,933,432	\$ 3,708,508	\$ 30,888,508		\$ -	
Covington-Harper Elementary	Sep-17	\$ 29,374,000	\$ 20,831,000			\$ 1,046,997		\$ 465,062	\$ 1,512,059	\$ 22,343,059	\$ 434,000	\$ -	
Kilby Elementary Replacement	Sep-17	\$ 31,476,000	\$ 21,888,000		\$ 165,122	\$ 1,352,999	\$ 1,439,634	\$ 502,486	\$ 3,460,240	\$ 25,348,240	\$ -	\$ 135,398	
Wilson Elementary	Sep-16	\$ 28,534,000	\$ 20,753,000		\$ 63,670	\$ 1,204,514	\$ 1,578,604	\$ 862,412	\$ 3,709,201	\$ 24,462,201	\$ 425,000	\$ -	\$ 24,887,201
Maintenance Facility	Sep-16	\$ 11,444,000	\$ 8,074,000	\$ 37,561	\$ 130,361	\$ 1,060,296	\$ 320,220	\$ 200,789	\$ 1,749,227	\$ 9,823,227	\$ -		\$ 9,823,227
Colgan High School	Sep-16	\$ 110,943,000	\$ 97,907,000	\$ 145,919	\$ 521,568	\$ 5,125,055	\$ 4,925,417	\$ (625,388)	\$ 10,092,571	\$ 107,999,571	\$ 1,988,547	\$ 8,785,796	\$ 118,773,914
Yung Elementary	Sep-15	\$ 25,987,000	\$ 20,286,000	\$ 54,809	\$ 197,660	\$ 1,004,729	\$ 1,561,177	\$ 770,928	\$ 3,589,302	\$ 23,875,302	\$ 419,000	\$ 3,345,844	\$ 27,640,146
Haymarket Elementary	Sep-14	\$ 27,663,000	\$ 18,788,000	\$ (262,583)	\$ 135,764	\$ 1,133,312	\$ 1,120,361	\$ 993,391	\$ 3,120,245	\$ 21,908,245	\$ 339,295	\$ 16,679	\$ 22,264,219
Nokesville School, The	Sep-14	\$ 31,000,000	\$ 28,402,000	\$ 174,854	\$ 124,920	\$ 2,252,698	\$ 1,363,551	\$ 2,213,724	\$ 6,129,747	\$ 34,531,747	\$ 230,000	\$ 236,665	\$ 34,998,412
PACE West Special	Sep-12	\$ 11,526,000	\$ 7,698,000	\$ 265,453	\$ 156,019	\$ 753,631	\$ 644,474	\$ 882,705	\$ 2,702,282	\$ 10,400,282	\$ -	\$ 93,537	\$ 10,493,819
Reagan Middle	Sep-12	\$ 26,382,000	\$ 18,914,000	\$ 196,592	\$ 188,871	\$ 1,017,882	\$ 2,178,833	\$ 1,442,048	\$ 5,024,226	\$ 23,938,226	\$ 719,000	\$ 4,261	\$ 24,661,487
Patriot High	Sep-11	\$ 84,110,000	\$ 70,699,000	\$ 1,683,390	\$ 288,976	\$ 4,334,084	\$ 3,892,000	\$ 2,667,044	\$ 12,865,494	\$ 83,564,494	\$ 1,640,000	\$ 7,391,771	\$ 92,596,265
T. Clay Wood Elementary	Sep-11	\$ 18,494,000	\$ 13,859,000	\$ 456,286	\$ 169,805	\$ 997,612	\$ 1,243,359	\$ 538,566	\$ 3,405,627	\$ 17,264,627	\$ 302,000	\$ -	\$ 17,566,627
Piney Branch Elementary	Sep-11	\$ 21,224,000	\$ 15,799,000	\$ 416,944	\$ 112,149	\$ 1,089,081	\$ 1,246,023	\$ 572,321	\$ 3,436,517	\$ 19,235,517	\$ 302,000	\$ 4,252,663	\$ 23,790,180

¹ Construction contract to build the facility; may include site preparation work, road improvements, and other construction items as specified in the bid documents

² Change orders include errors and omissions, charges initiated by the owner, inspection outcomes, school-based staff generated changes, and unanticipated site conditions

³ On-site construction project managers, custodial services

⁴ Architectural and Engineering Services, traffic analyses, environmental analyses, archeological studies

⁵ Outfitting costs for desks, smart-boards, office furniture, computers, servers, athletic and PE equipment, lab equipment, and other equipment that is not part of the physical structure of the building

⁶ Utility Fees, easements, traffic signalization, inspection services, stormwater fees, wetlands mitigation and monitoring, erosion controls, and other unclassified expenses

⁷ Expendable Equipment and Materials to include: instructional supplies, office supplies, instruction kits, textbooks, library books, glassware, P.E. equipment, uniforms for athletics / music programs, etc., as well as the salaries of the principal and bookkeeper during the initial startup period

⁸ Purchase of properties, easements, rights of way, and associated settlement and title fees

Bond Expenditure Data

Bond Issuance: Virginia Public School Authority 2017 (V17A)

Bond Issuance	Project Name	Func	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
			Original Bond Disbursement			
V17A	Alternative Education School - New Construction	201Z	\$ 25,850,000			\$ 25,850,000
V17A	Lake Ridge Middle School - Addition (13 rooms)	472E	\$ 10,437,000			\$ 10,437,000
V17A	Pattie Elementary School - Addition (10 rooms)	313D	\$ 8,300,000			\$ 8,300,000
V17A	Special Needs Transportation Center @ New Dominion	043K	\$ 1,700,000			\$ 1,700,000
V17A	Site Acquisition Funding	517A	\$ 14,000,000			\$ 14,000,000
V17A	Antietam Elementary School - Addition (13 rooms) A&E	376C	\$ 600,000			\$ 600,000
V17A	Lake Ridge Elementary School - Addition (13 rooms)	318C	\$ 600,000			\$ 600,000
V17A	Springwoods Elementary School - Addition (13 rooms)	332D	\$ 600,000			\$ 600,000
V17A	Elementary School East (PW Parkway) - New Construction	319A	\$ 2,000,000			\$ 2,000,000
V17A	Leesylvania Elementary School - Addition (4 rooms) A&E	383E	\$ 500,000			\$ 500,000
V17A	Stonewall Middle School - Addition (17 rooms) A&E	448K	\$ 1,000,000			\$ 1,000,000
V17A	Western Bus Facility - New Construction A&E	043M	\$ 1,500,000			\$ 1,500,000
V17A	Middle School at Potomac Shores - New Construction	414A	\$ 2,000,000			\$ 2,000,000
V17A	13th High School (West) - New Construction A&E	513A	\$ 3,000,000			\$ 3,000,000
V17A	River Oaks Elementary School - Renewal (Funding Phase 1)	375C	\$ 6,000,000			\$ 6,000,000
V17A	Saunders Middle School - Renewal (Funding Phase 2)	438F	\$ 2,600,000			\$ 2,600,000
V17A	Lake Ridge Middle School - Renewal (Funding Phase 2)	472E	\$ 2,600,000			\$ 2,600,000
V17A	Westridge Elementary School - Renewal (Funding Phase)	374C	\$ 98,000			\$ 98,000
Total			\$ 83,385,000	\$ -	\$ -	\$ 83,385,000

**Bond Issuance:
Virginia Public School Authority 2016 (V16A)**

Bond Issuance	Project Name	Func	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
			Original Bond Disbursement			
V16A	Elementary School (Potomac Shores)	309A	\$ 27,374,000	\$ (8,800,000)		\$ 18,574,000
V16A	Kilby Elementary School Replacement	344B	\$ 24,476,000	\$ (5,000,000)		\$ 19,476,000
V16A	13th High School -- Site Acquisition Funds	513A	\$ 13,500,000			\$ 13,500,000
V16A	Henderson Elementary School Addition (10 rooms)	333E	\$ 8,918,000			\$ 8,918,000
V16A	Belmont Elementary Addition (10 rooms)	360G	\$ 8,267,000			\$ 8,267,000
V16A	Neabsco Elementary School Addition (8 rooms)	370D	\$ 7,504,000			\$ 7,504,000
V16A	Saunders Middle School - Renewal	438F	\$ 6,175,000	\$ 5,800,000		\$ 11,975,000
V16A	Antietam Elementary School - Renewal	376B	\$ 5,000,000	\$ 2,800,000		\$ 7,800,000
V16A	McAuliffe Elementary School - Renewal	373C	\$ 5,000,000	\$ 2,120,000		\$ 7,120,000
V16A	Westridge Elementary School - Renewal	374C	\$ 5,000,000	\$ 1,000,000		\$ 6,000,000
V16A	Mullen Elementary School - Renewal	377D	\$ 5,000,000	\$ 880,000		\$ 5,880,000
V16A	Lake Ridge Middle School - Renewal	472E	\$ 5,000,000			\$ 5,000,000
V16A	PACE East Replacement/Multi-Space - A&E and initial construction	201Z	\$ 5,000,000			\$ 5,000,000
V16A	Middle School (Potomac Shores) - A&E	414A	\$ 3,000,000			\$ 3,000,000
V16A	13th High School (West) - A&E	513A	\$ 2,000,000	\$ 1,000		\$ 2,001,000
V16A	Elementary School - Site Acquisition Funds	319A	\$ 2,000,000	\$ (2,000,000)		\$ -
V16A	Lake Ridge Middle School Addition (13 rooms) - A&E	472E	\$ 1,000,000	\$ 1,200,000		\$ 2,200,000
V16A	Pattie Elementary School Addition (10 rooms) - Consolidation / Building Renovation @ Washington-Reid - A&E	313D	\$ 900,000			\$ 900,000
V16A	Special Needs Transportation Center @ New Dominion - A&E	043K	\$ 300,000			\$ 300,000
V16A	Division Wide - Site Acquisition	0370		\$ 2,000,000		\$ 2,000,000
Total			\$ 135,414,000	\$ 1,000	\$ -	\$ 135,415,000

**Bond Issuance:
Virginia Public School Authority 2015 (V15A)**

Bond Issuance	Project Name	Func	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
			<i>Original Bond Disbursement</i>			
V15A	12th High School	501A	\$ 49,971,500		\$ (5,822,119)	\$ 44,149,381
V15A	Elementary School - Ferlazzo	306A	\$ 27,534,000	\$ (1,000,000)	\$ (10,500,000)	\$ 16,034,000
V15A	Independent Hill Maintenance Facility	603H	\$ 10,000,000			\$ 10,000,000
V15A	Rippon Middle Addition	459K	\$ 7,110,000			\$ 7,110,000
V15A	Kilby ES Replacement	344B	\$ 6,000,000			\$ 6,000,000
V15A	PACE East Replacement	201Z	\$ 2,000,000		\$ 5,200,000	\$ 7,200,000
V15A	Elementary School - Potomac Shores - A/E	309A	\$ 2,000,000			\$ 2,000,000
V15A	Henderson ES - Addition A/E	333E	\$ 400,000			\$ 400,000
V15A	Belmont ES Addition - A/E	360G	\$ 400,000			\$ 400,000
V15A	Neabsco ES Addition - A/E	370D	\$ 400,000			\$ 400,000
V15A	Site Acquisition	0370		\$ 1,000,000		\$ 1,000,000
V15A	Henderson ES Addition - A/E	333D			\$ 1,332,206	\$ 1,332,206
V15A	King ES - Renewal	316D			\$ 1,919,055	\$ 1,919,055
V15A	Lake Ridge ES - Renewal	318B			\$ 1,500,000	\$ 1,500,000
V15A	Occoquan ES - HVAC	326G			\$ 290,187	\$ 290,187
V15A	Springwoods ES - Renewal	332C			\$ 1,500,000	\$ 1,500,000
V15A	Featherstone ES - Roof Repl	345F			\$ 258,278	\$ 258,278
V15A	Tyler ES - Activity Room	363F			\$ 1,000,000	\$ 1,000,000
V15A	McAuliffe ES - Renewal	373C			\$ 391,117	\$ 391,117
V15A	Antietam ES - Renewal	376B			\$ 389,318	\$ 389,318
V15A	Mullen ES - Renewal	377D			\$ 321,453	\$ 321,453
V15A	Marshall ES - HVAC	379E			\$ 260,063	\$ 260,063
V15A	Saunders MS - Renewal	438F			\$ 438,992	\$ 438,992
V15A	Hylton HS - Roof	571H			\$ 1,521,450	\$ 1,521,450
Total			\$ 105,815,500	\$ -	\$ -	\$ 105,815,500

**Bond Issuance:
Virginia Public School Authority 2014 (V14A)**

Bond Issuance	Project Name	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
		<i>Original Bond Disbursement</i>			
V14A	Elementary School - Devlin Road	\$ 25,937,000		\$ (300,000)	\$ 25,637,000
V14A	Featherstone Elementary Addition (6 rooms)	\$ 8,531,000			\$ 8,531,000
V14A	12th High School/IHS (Mid-County)	\$ 49,971,500	\$ (3,000,000)		\$ 46,971,500
V14A	Elementary School/IHS (East - Ferlazzo)	\$ 2,000,000	\$ (850,000)		\$ 1,150,000
V14A	Rippon Middle Addition/IHS East (9 rooms)	\$ 350,000			\$ 350,000
V14A	Maintenance Facility	\$ 1,444,000			\$ 1,444,000
V14A	Kilby Elementary School Replacement	\$ 1,000,000			\$ 1,000,000
V14A	Kerrydale ES - Activity Room	\$ -	\$ 1,500,000	\$ -	\$ 1,500,000
V14A	Enterprise ES - Activity Room	\$ -	\$ 1,500,000	\$ -	\$ 1,500,000
V14A	Potomac Shores MS - site	\$ -	\$ 850,000	\$ -	\$ 850,000
V14A	Dale City ES - Activity Room	\$ -		\$ 150,000	\$ 150,000
V14A	Minnieville ES - Activity Room	\$ -		\$ 150,000	\$ 150,000
Total		\$ 89,233,500	\$ -	\$ -	\$ 89,233,500

**Bond Issuance:
Virginia Public School Authority 2013 (V13A)**

Bond Issuance	Project Name	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
		<i>Original Bond Disbursement</i>			
V13A	Nokesville School, The - Building, New	\$ 11,000,000			\$ 11,000,000
V13A	Haymarket ES - Building, New	\$ 27,663,000	\$ (1,320,000)	\$ (3,454,000)	\$ 22,889,000
V13A	Dumfries ES - Renewal	\$ 3,825,000		\$ 684,000	\$ 4,509,000
V13A	River Oaks ES - Addition	\$ 5,913,000	\$ 700,000	\$ (470,000)	\$ 6,143,000
V13A	Parkside MS - Addition	\$ 10,559,000			\$ 10,559,000
V13A	12th HS Site - Building, New	\$ 8,000,000	\$ 570,000	\$ 3,000,000	\$ 11,570,000
V13A	Featherstone ES - A/E, Addition	\$ 300,000	\$ 50,000		\$ 350,000
V13A	Kerrydale ES - Activity Room	\$ -	\$ -	\$ 80,000	\$ 80,000
V13A	Enterprise ES - Activity Room	\$ -	\$ -	\$ 80,000	\$ 80,000
V13A	Tyler ES - Activity Room	\$ -	\$ -	\$ 80,000	\$ 80,000
Total		\$ 67,260,000	\$ -	\$ -	\$ 67,260,000

**Bond Issuance:
Virginia Public School Authority 2012 (V12A)**

Bond Issuance	Project Name	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
		<i>Original Bond Disbursement</i>			
V12A	Potomac HS - Renewal/Addition	\$ 7,655,000	\$ 500,000		\$ 8,155,000
V12A	Pattie ES - Renewal	\$ 3,806,000	\$ (36,000)	\$ (100,000)	\$ 3,670,000
V12A	Loch Lomond ES - Addition	\$ 5,950,000	\$ 871,000	\$ (350,000)	\$ 6,471,000
V12A	Mullen ES - Addition	\$ 5,700,000	\$ 302,000	\$ (600,000)	\$ 5,402,000
V12A	Nokesville K-8 - Building, New	\$ 14,000,000	\$ 3,630,000		\$ 17,630,000
V12A	Penn ES - Addition	\$ 5,817,000	\$ (971,000)	\$ (550,000)	\$ 4,296,000
V12A	River Oaks ES - A/E, Addition	\$ 300,000	\$ 36,000	\$ (26,000)	\$ 310,000
V12A	Sinclair ES - Addition	\$ 6,260,000	\$ (33,000)		\$ 6,227,000
V12A	Sudley ES - Addition	\$ 6,100,000	\$ (118,000)	\$ (174,000)	\$ 5,808,000
V12A	West Gate ES - Addition	\$ 3,140,000	\$ 1,002,000		\$ 4,142,000
V12A	Benton MS - Addition	\$ 7,247,000	\$ (2,635,000)		\$ 4,612,000
V12A	Parkside MS - A/E, Addition	\$ 500,000			\$ 500,000
V12A	Potomac MS - Addition	\$ 7,770,000	\$ (2,548,000)		\$ 5,222,000
V12A	12th site - A/E	\$ 3,000,000			\$ 3,000,000
V12A	Loch Lomond ES - Renewal, A/E			\$ 350,000	\$ 350,000
V12A	Henderson ES - Renewal, A/E			\$ 350,000	\$ 350,000
V12A	King ES - Renewal, A/E			\$ 350,000	\$ 350,000
V12A	Lake Ridge ES - Renewal, A/E			\$ 350,000	\$ 350,000
V12A	Springwoods ES - Renewal, A/E			\$ 350,000	\$ 350,000
V12A	Devlin Road ES - Building, New, A/E			\$ 50,000	\$ 50,000
	Total	\$ 77,245,000	\$ -	\$ -	\$ 77,245,000

Bond Issuance:
Virginia Public School Authority 2011 (V11A)

Bond Issuance	Project Name	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
		<i>Original Bond Disbursement</i>			
V11A	A&E Mullen, Sinclair, Sudley, West Gate, Loch Lomond	\$ 1,500,000	\$ 100,000		\$ 1,600,000
V11A	Bus Parking (Gar-Field HS)	\$ 1,009,000			\$ 1,009,000
V11A	PACE West SE	\$ 8,026,000		\$ (20,000)	\$ 8,006,000
V11A	Piney Branch Elementary	\$ 5,000,000	\$ (1,750,000)	\$ (730,000)	\$ 2,520,000
V11A	Potomac HS Addition	\$ 7,655,000			\$ 7,655,000
V11A	Reagan Middle	\$ 12,150,000		\$ (1,900,000)	\$ 10,250,000
V11A	Swans Creek	\$ 4,765,000	\$ (450,000)	\$ (1,365,925)	\$ 2,949,075
V11A	T. Clay Wood Elementary	\$ 4,000,000	\$ (450,000)	\$ (850,000)	\$ 2,700,000
V11A	Westridge ES Addition	\$ 4,130,000	\$ 450,000		\$ 4,580,000
V11A	Nokesville K-8 School (A&E)		\$ 500,000	\$ (203,053)	\$ 296,947
V11A	Penn Elementary School Addition (A&E)		\$ 350,000		\$ 350,000
V11A	Benton Middle School Addition (A&E)		\$ 450,000		\$ 450,000
V11A	Potomac Middle School Addition (A&E)		\$ 350,000		\$ 350,000
V11A	Parkside Middle School Addition (A&E)		\$ 450,000	\$ (65,075)	\$ 384,925
V11A	Devlin Road Elementary Site (A&E)			\$ 750,000	\$ 750,000
V11A	Haymarket Drive ES Site (A&E)			\$ 100,000	\$ 100,000
V11A	Occoquan ES Activity Room (A&E)			\$ 100,000	\$ 100,000
V11A	Dumfries ES Renewal (A&E)			\$ 300,000	\$ 300,000
V11A	Potomac HS Renewal / Addition			\$ 2,931,000	\$ 2,931,000
V11A	Occoquan ES Activity Room			\$ 953,053	\$ 953,053
	Total	\$ 48,235,000	\$ -	\$ -	\$ 48,235,000

Bond Issuance:
Virginia Public School Authority 2010 (V10A)

Bond Issuance	Project Name	Anticipated /Estimated Cost in CIP	Adjustments - Year 1	Adjustments - Year 2	Resulting Project Amount
		<i>Original Bond Disbursement</i>			
V10A	Linton Hall Road Elementary	\$ 16,224,000	\$ (200,000)	\$ (100,000)	\$ 15,924,000
V10A	Patriot High School	\$ 37,285,000		\$ (500,000)	\$ 36,785,000
V10A	Reagan Middle	\$ 14,232,000	\$ (500,000)	\$ 46,960	\$ 13,778,960
V10A	T. Clay Wood Elementary	\$ 14,494,000	\$ (200,000)	\$ (350,000)	\$ 13,944,000
V10A	Haymarket Drive Elementary (A&E)		\$ 900,000	\$ (141,275)	\$ 758,725
V10A	Patriot High School (A&E)			\$ 44,315	\$ 44,315
V10A	Potomac High School - Renewal/Addition			\$ 1,000,000	\$ 1,000,000
	Total	\$ 82,235,000	\$ -	\$ -	\$ 82,235,000

Commonwealth of Virginia
Comparative School Construction Cost Data

New Elementary Schools

2008-09 through 2016-17

Year	Name	Grades	Division	Contract Award Date	Maximum ¹ Operating Capacity	Building Cost	Site Cost	Total ² Cost	Total Sq Ft	Total Cost/ Sq Ft	Building Only Cost/Sq Ft	Total Cost/ Pupil
2016-17	Colonial Beach	PK-7	Colonial Beach	Jul-16	442	\$7,160,934	\$766,066	\$7,927,000	50,079	\$158.29	\$142.99	\$17,934
	Fort Belvoir Elementary School II	PK-6	Fairfax County	Apr-15	576	\$17,330,700	\$4,840,320	\$22,171,020	95,341	\$232.54	\$181.78	\$38,491
	New Harrisonburg Elementary	K-5	Harrisonburg City	Mar-16	916	\$21,414,376	\$4,496,390	\$25,910,766	103,703	\$249.86	\$206.50	\$28,287
	Meadow View Elementary	PK-5	Henry County	Jul-16	776	\$19,691,800	\$963,900	\$20,655,700	96,000	\$215.16	\$205.12	\$26,618
	Loudoun Elementary-ES 28	K-5	Loudoun County	Feb-17	988	\$24,310,000	\$4,000,000	\$28,310,000	136,200	\$207.86	\$178.49	\$28,654
	Potomac Shores ES	K-5	Prince William County	Mar-16	889	\$16,646,000	\$4,185,000	\$20,831,000	101,246	\$205.75	\$164.41	\$23,432
	Northern Suffolk Elementary (Bowser Replacement)	PK-5	Suffolk City	Jun-16	984	\$18,190,000	\$2,630,000	\$20,820,000	114,881	\$181.23	\$158.34	\$21,159
2015-16	Hugh Cassell Elementary	PK-5	Augusta County	Dec-15	930	\$15,462,984	\$3,016,691	\$18,479,675	94,500	\$195.55	\$163.63	\$19,871
	Riverheads Elementary	PK-5	Augusta County	Dec-15	930	\$16,593,846	\$2,339,205	\$18,933,051	94,500	\$200.35	\$175.60	\$20,358
	Bowling Elementary	PK-5	Norfolk City	Dec-14	780	\$15,898,428	\$2,474,221	\$18,372,649	101,060	\$181.80	\$157.32	\$23,555
	New Ocean View Elementary Repl	K-5	Norfolk City	Dec-14	808	\$15,577,911	\$3,059,275	\$18,637,186	92,286	\$201.95	\$168.80	\$23,066
	New Larchmont Elementary Repl	K-5	Norfolk City	Dec-14	778	\$15,823,153	\$3,221,874	\$19,045,027	92,655	\$205.55	\$170.77	\$24,479
	Martin Luther King Pre-K	PK	Richmond City	Jun-14	260	\$4,879,986	\$454,818	\$5,334,804	22,097	\$241.43	\$220.84	\$20,518
2014-15	New Lexington Elementary	PK-5	Lexington City	Aug-14	480	\$12,500,000	\$1,605,000	\$14,105,000	53,804	\$262.16	\$232.32	\$29,385
	ES-27	K-5	Loudoun County	Apr-15	1,012	\$18,903,548	\$4,491,800	\$23,395,348	105,757	\$221.22	\$178.75	\$23,118
	Baldwin Elementary/Int	PK-6	Manassas City	Mar-15	1,019	\$29,746,448	\$2,839,553	\$32,586,001	139,114	\$234.24	\$213.83	\$31,978
	Magruder Elementary Repl	K-5	Newport News City	Jul-14	916	\$20,371,304	\$2,444,695	\$22,815,999	97,612	\$233.74	\$208.70	\$24,908
	Wilson Elementary	K-5	Prince William County	Mar-15	921	\$16,753,000	\$4,000,000	\$20,753,000	106,354	\$195.13	\$157.52	\$22,533
	Kilby Elementary Repl	K-5	Prince William County	Apr-15	876	\$15,506,000	\$6,382,000	\$21,888,000	98,615	\$221.95	\$157.24	\$24,986
	John Kerr Elementary	PK-5	Winchester City	Apr-14	853	\$15,030,000	\$1,565,000	\$16,595,000	94,000	\$176.54	\$159.89	\$19,455
2013-14	Arlington Elementary No.1	PK-5	Arlington County	Mar-14	684	\$28,199,928	\$4,105,880	\$32,305,808	97,588	\$331.04	\$288.97	\$47,231
	Yung Elementary	K-5	Prince William Co	Dec-13	905	\$16,186,000	\$4,100,000	\$20,286,000	107,273	\$189.11	\$150.89	\$22,415
2012-13	Haymarket Elementary	K-5	Prince William Co	Feb-13	868	\$14,396,000	\$4,392,000	\$18,788,000	99,135	\$189.52	\$145.22	\$21,645
	South Salem	K-5	Salem City	Apr-12	600	\$13,235,950	\$1,667,250	\$14,903,200	90,913	\$163.93	\$145.59	\$24,839
	New Elementary ³	PK-5	Smyth Co	Nov-11	603	\$11,122,199	\$4,078,016	\$15,200,215	83,717	\$181.57	\$132.85	\$25,208
2011-12	West Area ES #9	K-5	Henrico Co	Jun-11	788	\$11,394,069	\$1,473,256	\$12,867,325	78,400	\$164.12	\$145.33	\$16,329
	Moorefield Station	K-5	Loudoun Co	Apr-12	988	\$15,393,220	\$3,449,571	\$18,842,791	105,951	\$177.84	\$145.29	\$19,072
	Discovery	K-5	Loudoun Co	Apr-12	988	\$14,951,844	\$3,954,311	\$18,906,155	105,951	\$178.44	\$141.12	\$19,136
	Oak Grove ⁴	K-5	Richmond City	Sep-11	704	\$14,857,440	\$2,103,216	\$16,960,656	90,810	\$186.77	\$163.61	\$24,092
	Broad Rock/Bellemeade ⁵	K-5	Richmond City	Sep-11	704	\$16,849,512	\$2,495,489	\$19,345,001	90,810	\$213.03	\$185.55	\$27,479
2010-11	Lacey	K-6	Fairfax Co	Jul-10	935	\$11,880,100	\$1,868,900	\$13,749,000	98,590	\$139.46	\$120.50	\$14,705
	Graham Road	PK-6	Fairfax Co	Sep-10	400	\$10,121,565	\$369,435	\$10,491,000	81,354	\$128.95	\$124.41	\$26,228
	Frederick Douglass	K-5	Loudoun Co	Apr-11	940	\$16,685,000	\$5,206,000	\$21,891,000	100,477	\$217.87	\$166.06	\$23,288
2009-10	Simondale	PK-5	Portsmouth City	Nov-09	780	\$11,066,000	\$3,100,000	\$14,166,000	80,000	\$177.08	\$138.33	\$18,162
	College Park ⁶	K-5	Va Beach City	Jan-10	616	\$14,738,600	\$3,184,000	\$17,922,600	94,231	\$190.20	\$156.41	\$29,095
	Mason Cove	PK-5	Roanoke Co	Dec-09	336	\$7,763,717	\$2,073,341	\$9,837,058	52,530	\$187.27	\$147.80	\$29,277
	Prices' Fork	PK-5	Montgomery Co	Jan-10	838	\$13,666,750	\$1,933,250	\$15,600,000	106,300	\$146.75	\$128.57	\$18,616
	Kettle Run	K-5	Prince William Co	Mar-10	889	\$12,476,000	\$1,383,000	\$13,859,000	104,829	\$132.21	\$119.01	\$15,589
	Linton Hall	K-5	Prince William Co	May-10	889	\$13,281,981	\$2,527,726	\$15,809,707	104,829	\$150.81	\$126.70	\$17,784
2008-09	Moss Knuckols ⁷	PK-5	Louisa Co	Sep-08	792	\$10,569,784	\$2,822,216	\$13,392,000	85,620	\$156.41	\$123.45	\$16,909
	9th Elementary ⁸	PK-5	Williamsburg/JC Co	Nov-08	730	\$15,958,569	\$1,882,650	\$17,841,219	93,247	\$191.33	\$171.14	\$24,440
	Elliston Shawsville ⁹	PK-5	Montgomery Co	Nov-08	838	\$15,920,182	\$2,685,818	\$18,606,000	106,300	\$175.03	\$149.77	\$22,203
	Buffalo Trail ¹⁰	K-5	Loudoun Co	Jan-09	989	\$10,714,000	\$5,639,290	\$16,353,290	102,141	\$160.11	\$104.89	\$16,535

* The final report for 2016-17 will be generated after June 30, 2017.

1 - Division operating capacity may differ from SOL maximum capacity. Pre-kindergarten classrooms counted at 16 students, grades K-3 classrooms counted at 24:1, grades 4-5 classrooms counted at 25:1.

2 - Usually includes construction, site development, water system, sewage disposal, built-in equipment and demolition. A&E fees, value engineering, construction management fees, cost of site, loose equipment, and furniture are excluded.

3 - Site cost include \$270,000 for egress road and \$924,000 for off-site utilities.

4 - Excludes cost of community center, and includes cost for the demolition of the existing building.

5 - Includes cost of demolition of old school building.

6 - Site cost includes \$135,000 for demolition of existing school and abatement work.

7 - Includes on-site sewage treatment plant and on-site water system.

8 - Site cost was split proportionally with new middle school being built on same site.

9 - Includes \$321,690 for off-site sewer, force main and pump station.

10 - Includes off-site developer cost for \$1,931,290 which is in the general contract.

New Middle Schools 2008-09 through 2016-17

Year	Name	Grades	Division	Contract Award Date	Maximum ¹ Operating Capacity	Building Cost	Site Cost	Total ² Cost	Total Sq Ft	Total Cost/ Sq Ft	Building Only Cost/Sq Ft	Total Cost/ Pupil
2016-17	New Bedford Middle	6-8	Bedford County	Nov-16	754	\$23,098,130	\$5,701,235	\$28,799,365	123,822	\$232.59	\$186.54	\$38,195
	MS-7	6-8	Loudoun County	Feb-17	1,354	\$44,126,500	\$6,938,500	\$51,065,000	185,251	\$275.65	\$238.20	\$37,714
	Northern Suffolk Middle	6-8	Suffolk City	Jun-16	779	\$22,460,000	\$2,715,000	\$25,175,000	125,220	\$201.05	\$179.36	\$32,317
	James Blair Middle	6-8	Williamsburg James City	Sep-16	605	\$20,137,000	\$1,877,735	\$22,014,735	110,871	\$198.56	\$181.63	\$36,388
	Academies of Loudoun	9-12	Loudoun County	Oct-15	1,250	\$77,000,000	\$9,500,000	\$86,500,000	319,000	\$271.16	\$241.38	\$69,200
	Alternative Education School	1-12	Prince William County	Jun-16	480	\$23,383,520	\$3,796,418	\$27,179,938	122,659	\$221.59	\$190.64	\$56,625
	Dayton Learning Center	6-12	Rockingham County	Feb-17	180	\$4,095,912	\$727,388	\$4,823,300	19,544	\$246.79	\$209.57	\$26,796
2015-16	MS-9	6-8	Loudoun County	Aug-15	1,354	\$40,081,400	\$9,262,600	\$49,344,000	184,593	\$267.31	\$217.13	\$36,443
	Happy Creek Middle	6-8	Warren County	Jul-15	915	\$27,878,940	\$5,041,310	\$32,920,250	158,457	\$207.76	\$175.94	\$35,978
	Campostella STEM School	K-8	Norfolk City	Dec-14	1,151	\$27,017,178	\$2,815,912	\$29,833,090	181,489	\$164.38	\$148.86	\$25,919
2014-15	Frederick County Middle	6-8	Frederick County	Nov-15	921	\$35,592,328	\$5,907,672	\$41,500,000	186,163	\$222.92	\$191.19	\$45,060
	New Page Middle	6-8	Gloucester County	Sep-15	738	\$18,931,000	\$3,922,763	\$22,853,763	118,237	\$193.29	\$160.11	\$30,967
	Old Donation Center & Kemps Landing Magnet	2-8	Virginia Beach City	May-14	1,375	\$45,448,808	\$5,124,278	\$50,573,086	225,785	\$223.99	\$201.29	\$36,780
2013-14	Jefferson-Houston	PK-8	Alexandria City	Jun-13	805	\$31,961,348	\$4,695,397	\$36,656,745	124,500	\$294.43	\$256.72	\$45,536
2012-13	Trailside	6-8	Loudoun Co	Jun-12	1,154	\$26,874,012	\$3,221,898	\$30,095,910	175,064	\$171.91	\$153.51	\$26,080
	Martin Luther King ³	6-8	Richmond City	Apr-12	847	\$27,306,636	\$2,835,518	\$30,142,154	149,600	\$201.48	\$182.53	\$35,587
2011-12	Nokesville K-8 School	K-8	Prince William Co	Jun-12	924	\$22,602,000	\$5,800,000	\$28,402,000	141,832	\$200.25	\$159.36	\$30,738
2010-11	<i>No Projects Reported</i>											
2009-10	Ronald Reagan Middle	6-8	Prince William Co	Feb-10	1,102	\$15,265,478	\$3,648,522	\$18,914,000	133,480	\$141.70	\$114.37	\$17,163
	South County	6-8	Fairfax Co	Mar-10	1,172	\$19,293,100	\$2,656,900	\$21,950,000	176,021	\$124.70	\$109.61	\$18,729
	J. Michael Lunsford	6-8	Loudoun Co	Jan-10	1,351	\$24,145,000	\$4,281,000	\$28,426,000	177,880	\$159.80	\$135.74	\$21,041
2008-09	West Area ⁴	6-8	Henrico Co	Aug-08	1,000	\$19,715,150	\$3,500,000	\$23,215,150	120,024	\$193.42	\$164.26	\$23,215
	4th Middle School ⁵	6-8	Williamsburg/JC Co	Nov-09	830	\$26,031,431	\$3,822,350	\$29,853,781	145,458	\$205.24	\$178.96	\$35,968
	Great Neck ⁶	6-8	Va Beach City	Jul-09	1,212	\$28,706,998	\$6,320,002	\$35,027,000	223,260	\$156.89	\$128.58	\$28,900
	Orange ⁷	6-8	Orange Co	Feb-09	1,295	\$24,947,000	\$5,460,000	\$30,407,000	169,320	\$179.58	\$147.34	\$23,480

* The final report for 2016-17 will be generated after June 30, 2017.

1 - Division operating capacity may differ from SOL maximum capacity. State SOL capacity based on a pupil teacher ratio of 25:1 in core classrooms.

2 - Usually includes construction, site development, water system, sewage disposal, built-in equipment and demolition. A&E fees, value engineering, construction management fees, cost of site, loose equipment, and furniture are excluded.

3 - Cost include \$400,000 for site and building demolition, and a 2,835 square foot auxiliary gym.

4 - Building cost includes technology system and storage shed. Site cost includes \$185,000 traffic signal.

5 - Site cost split proportionally with new elementary school being built on the same site.

6 - Site cost includes \$611,420 for demolition of existing middle school building and asbestos abatement.

7 - Site cost includes \$2,060,000 for water, sewer, water tank, and road widening.

New High Schools 2008-09 through 2016-17

Year	Name	Grades	Division	Contract Award Date	Maximum ¹ Operating Capacity	Building Cost	Site Cost	Total ² Cost	Total Sq Ft	Total Cost/ Sq Ft	Building Only Cost/Sq Ft	Total Cost/ Pupil
2016-17	<i>No Projects Reported</i>											
2015-16	<i>No Projects Reported</i>											
2014-15	New Heritage High	9-12	Lynchburg City	Apr-14	1,452	\$42,544,428	\$20,879,572	\$63,424,000	266,151	\$238.30	\$159.85	\$43,680
	Union High School	9-12	Wise County	Nov-11	863	\$23,562,210	\$943,772	\$24,505,982	126,508	\$193.71	\$186.25	\$28,396
	Central High School	9-12	Wise County	Nov-11	863	\$25,082,622	\$411,396	\$25,494,018	126,508	\$201.52	\$198.27	\$29,541
2013-14	Louisa County High School	9-12	Louisa County	Jul-13	2,011	\$46,473,432	\$2,059,570	\$48,533,002	272,834	\$177.88	\$170.34	\$24,134
	Colgan High School	9-12	Prince William County	Dec-13	2,053	\$70,481,000	\$19,000,000	\$89,481,000	425,176	\$210.46	\$165.77	\$43,585
	New Huguenot High School	9-12	Richmond City	Jun-12	1,574	\$51,991,220	\$10,283,262	\$62,274,482	253,821	\$245.35	\$204.83	\$39,564
	Stafford High School Repl	9-12	Stafford County	Jun-13	2,102	\$50,715,200	\$9,106,800	\$59,822,000	281,653	\$212.40	\$180.96	\$28,460
2012-13	HS-6 at Loudoun Valley Estates II	9-12	Loudoun County	Feb-13	1,949	\$56,548,276	\$6,971,776	\$63,520,052	283,422	\$224.12	\$199.52	\$32,591
	Blacksburg High School	9-12	Montgomery County	Jul-11	1,650	\$47,258,625	\$7,621,578	\$54,880,203	293,286	\$187.12	\$161.13	\$33,261
	New Auburn High School	9-12	Montgomery County	Jul-11	853	\$27,985,261	\$4,261,737	\$32,246,998	180,940	\$178.22	\$154.67	\$37,804
2011-12	Kellum Replacement ³	9-12	Va Beach City	Aug-11	2,000	\$58,909,096	\$15,013,694	\$73,922,790	350,952	\$210.64	\$167.86	\$36,961
2010-11	Wakefield	9-12	Arlington Co	May-11	2,173	\$77,389,376	\$11,000,623	\$88,389,999	382,102	\$231.33	\$202.54	\$40,676
	NEW Clarke County	9-12	Clarke Co	Jul-10	884	\$19,550,000	\$3,750,000	\$23,300,000	162,050	\$143.78	\$120.64	\$26,357
	John Champe ⁴	9-12	Loudoun Co	Jan-11	1,955	\$40,996,000	\$19,766,000	\$60,762,000	275,574	\$220.49	\$148.77	\$31,080
2009-10	<i>No Projects Reported</i>											
2008-09	Henrico #1 ⁵	9-12	Henrico Co	Oct-08	1,868	\$50,700,000	\$7,133,623	\$57,833,623	255,000	\$226.80	\$198.82	\$30,960
	Tuscarora ⁶	9-12	Loudoun Co	Dec-08	1,895	\$45,071,040	\$11,000,000	\$56,071,040	279,426	\$200.67	\$161.30	\$29,589
	Woodgrove ⁷	9-12	Loudoun Co	Jan-09	1,651	\$44,375,000	\$9,500,000	\$53,875,000	251,915	\$213.86	\$176.15	\$32,632
	Fluvanna ⁸	9-12	Fluvanna Co	Mar-09	1,633	\$44,379,363	\$12,486,637	\$56,866,000	314,389	\$180.88	\$141.16	\$34,823
	Patriot High School	9-12	Prince William Co	Jan-09	2,053	\$58,655,600	\$12,043,400	\$70,699,000	312,067	\$226.55	\$187.96	\$34,437

* The final report for 2016-17 will be generated after June 30, 2017.

- 1 - Division operating capacity may differ from SOL maximum capacity. State operating capacity is generally based on a pupil teacher ratio of 25:1 in all program areas, at 90 percent.
- 2 - Usually includes construction, site development, water system, sewage disposal, built-in equipment and demolition. A&E fees, value engineering, construction management fees, cost of site, loose equipment, and furniture are excluded.
- 3 - Project cost includes required road widening, new turning lanes, football stadium, track, play fields, and other outside practice facilities.
- 4 - \$3,250,000 for required off-site road improvements.
- 5 - Total cost includes field house at \$1,480,000 and terrazzo flooring at \$300,500.
- 6 - Heavy grading, rock removal, as well as environmental issues increased site cost.
- 7 - On-site water and sewer systems were additional site costs.
- 8 - The base high school capacity is 1,633 students. The building includes spaces for career, technical and vocational programs for 100 additional students and core support facilities were sized for an additional 250 students.

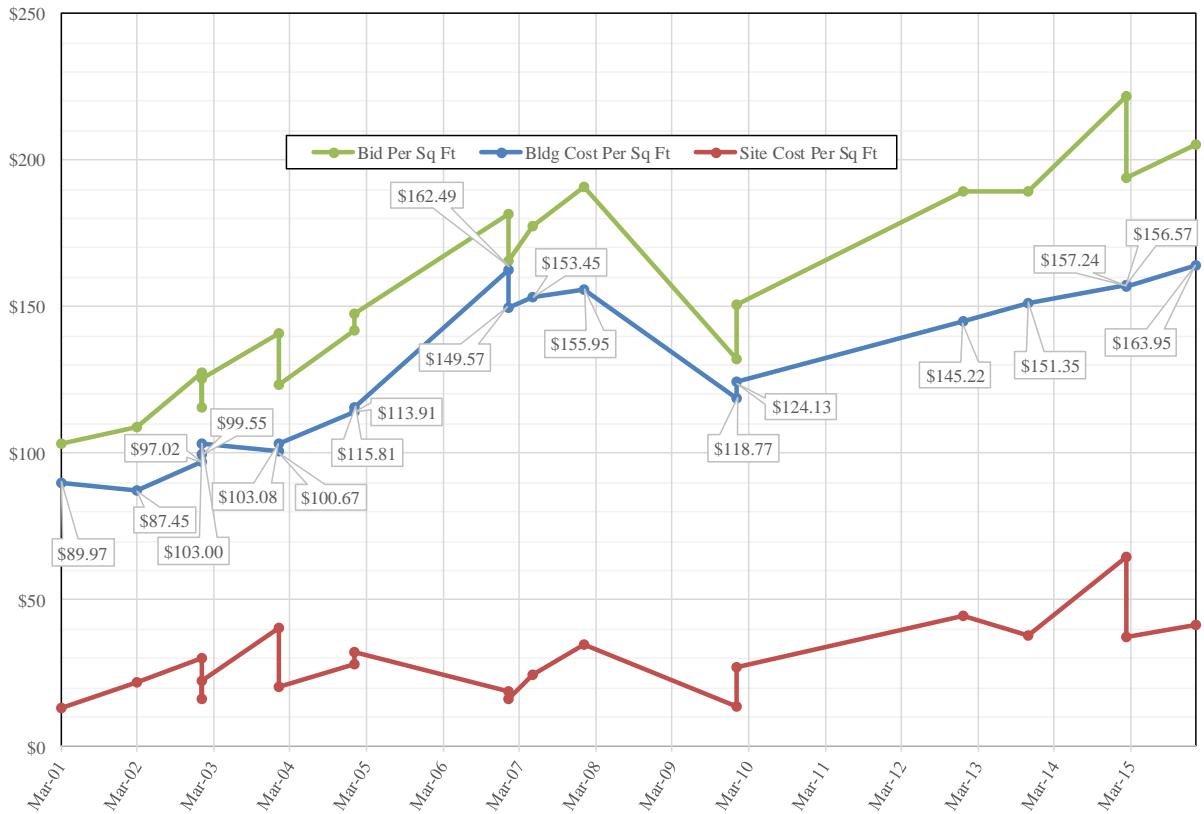
Elementary School Construction Cost Data

Prince William County Schools 2003-04 through 2014-15

Elementary School	Building Square Footage	School Construction Contract			Building Cost		Site Cost	
		Bid Date	Bid Contract Total	Contract Cost Per Sq Ft	Bldg Cost Total	Bldg Cost Per Sq Ft	Site Cost Total	Site Cost Per Sq Ft
Potomac Shores	101,528	Feb-16	\$20,831,000	\$205.17	\$15,981,000	\$157.40	\$4,850,000	\$47.77
Kilby ES Repl.	98,976	Mar-15	\$21,888,000	\$221.14	\$15,788,000	\$159.51	\$6,100,000	\$61.63
Ferlazzo	106,854	Feb-15	\$20,753,000	\$194.22	\$16,753,000	\$156.78	\$4,000,000	\$37.43
Devlin Road	107,273	Dec-13	\$20,286,000	\$189.11	\$16,186,000	\$150.89	\$4,100,000	\$38.22
Haymarket ⁵	99,135	Jan-13	\$18,788,000	\$189.52	\$14,396,000	\$145.22	\$4,392,000	\$44.30
Wood ⁴	104,958	Feb-10	\$13,859,000	\$132.04	\$12,437,000	\$118.50	\$1,422,000	\$13.55
Piney Branch	104,958	Feb-10	\$15,799,000	\$150.53	\$12,999,000	\$123.85	\$2,800,000	\$26.68
Triangle	103,679	Feb-08	\$19,769,000	\$190.68	\$16,169,000	\$155.95	\$3,600,000	\$34.72
Yorkshire	106,614	Jun-07	\$18,863,000	\$176.93	\$16,292,000	\$152.81	\$2,571,000	\$24.12
Gravelly	95,074	Feb-07	\$17,250,000	\$181.44	\$15,449,000	\$162.49	\$1,801,000	\$18.94
Fitzgerald ³	106,170	Feb-07	\$17,580,000	\$165.58	\$15,880,000	\$149.57	\$1,700,000	\$16.01
Buckland Mills	89,911	Feb-05	\$12,765,000	\$141.97	\$10,245,000	\$113.95	\$2,520,000	\$28.03
Parks	83,084	Feb-05	\$12,277,000	\$147.77	\$9,622,000	\$115.81	\$2,655,000	\$31.96
Glenkirk	83,084	Feb-04	\$11,711,000	\$140.95	\$8,364,000	\$100.67	\$3,347,000	\$40.28
Victory ²	89,911	Feb-04	\$11,380,000	\$126.57	\$9,505,000	\$105.72	\$1,875,000	\$20.85
Williams ¹	83,084	Feb-03	\$10,570,000	\$127.22	\$8,061,000	\$97.02	\$2,509,000	\$30.20
Ellis	76,724	Feb-03	\$8,869,000	\$115.60	\$7,638,000	\$99.55	\$1,231,000	\$16.04
Porter	71,245	Feb-03	\$8,945,000	\$125.55	\$7,338,000	\$103.00	\$1,607,000	\$22.56

- 1 Actual bid was 12,570. Approximately 2.0 million is for site work associated with adjacent middle school. For project comparison purposes bid amount and site sq. ft. amounts have been adjusted accordingly.
- 2 This site was pre-graded by the developer, value approximately 1.2 million. For project comparison purposes add 13.35 to project sq. ft. cost and to site sq. ft. cost.
- 3 This site was pre-graded by the developer, value approximately 700K. For project comparison purposes add 6.59 to project sq. ft. cost and to site sq. ft. cost.
- 4 This site was pre-graded which included partial utilities infrastructure and bus loop as part of the adjacent high school project, value approximately 650K. For project comparison purposes add 6.19 to project sq. ft. cost and to site sq. ft. cost.
- 5 This site was heavily wooded and contained \$845k in offsite utility / roadwork cost.

Elementary School Construction Cost Per Square Foot Prince William County Schools 2003-04 through 2014-15



	Mar-01	Mar-02	Feb-03	Feb-03	Feb-03	Feb-04	Feb-04	Feb-04	Feb-05	Feb-05	Feb-07	Feb-07	Jun-07	Feb-08	Feb-10	Feb-10	Jan-13	Nov-13	Mar-15	Mar-15	Feb-16
Bid Per Sq Ft	\$103.18	\$109.12	\$127.22	\$115.60	\$125.55	\$140.95	\$123.41	\$141.93	\$147.77	\$181.44	\$165.58	\$177.67	\$190.68	\$132.35	\$150.87	\$189.52	\$189.11	\$221.95	\$193.95	\$205.17	
Bldg Cost Per Sq Ft	\$89.97	\$87.45	\$97.02	\$99.55	\$103.00	\$100.67	\$103.08	\$113.91	\$115.81	\$162.49	\$149.57	\$153.45	\$155.95	\$118.77	\$124.13	\$145.22	\$151.35	\$157.24	\$156.57	\$163.95	

APPENDIX E

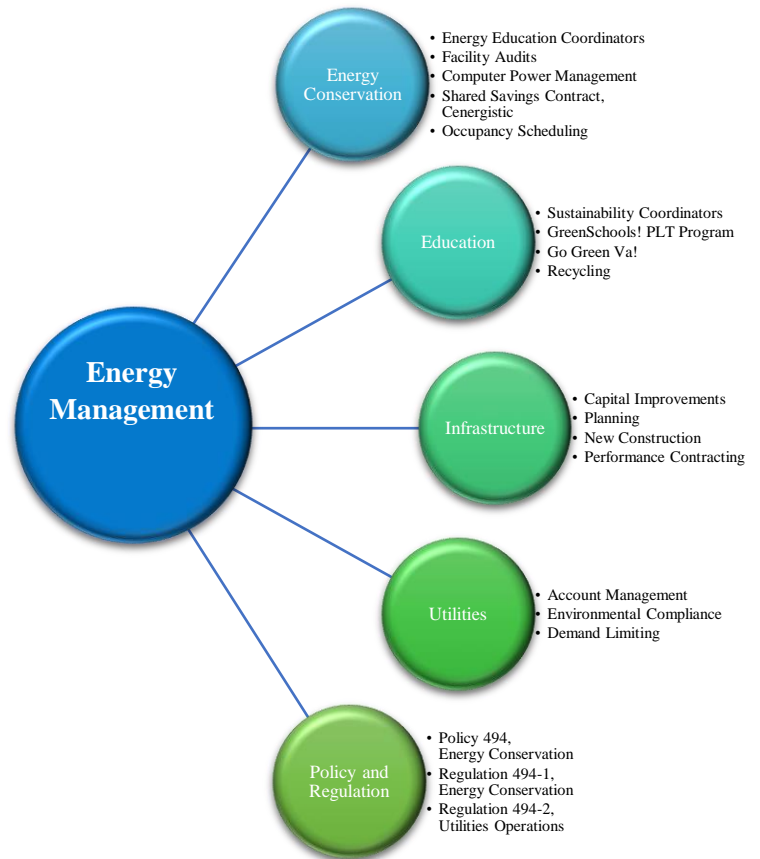
Energy Management

Energy Management

Energy Management in Prince William County Public Schools (PWCS) utilizes a multifaceted approach to energy stewardship and conservation. Policy 494 states that the School Board embraces energy conservation and believes it to be their responsibility to conserve energy and natural resources. Support and program oversight are the responsibility of the Office of Facilities Services. However, each school or facility has designated a site administrator who will be accountable for energy conservation.

Implementation of the energy conservation program shall be through a team led by the Office of Facilities Services' Administrative Coordinator, Energy Management, and Energy Education Coordinator(s), in accordance with Regulation 494-1. All decisions related to the implementation of this policy shall be firmly grounded in common sense.

Accurate records of energy consumption and cost will be maintained by the Office of Facilities Services for each site to provide verifiable performance results on the goals and progress of the energy conservation program.



Energy Conservation

Energy Education Coordinators

Energy Education Coordinators work to establish accountability for energy consumption at every level in the organization. These individuals are responsible for developing and monitoring the organization's energy management program, under School Board approved policies and regulations, for the purpose of reducing utility consumption.

Basic areas of responsibility include: administration and recordkeeping, accountability, reporting, program implementation, promoting organizational employee involvement, and validating energy management system compliance to the energy policy and guidelines. Energy Education Coordinators use EnergyCAP software to monitor energy usage trends.

The role of the Energy Education Coordinators is instrumental in the success of the energy conservation program and helping retain funds where they are most important – in the classroom.

Facility Audits

Sites within PWCS will be visited by an Energy Education Coordinator regularly. Audits conducted during the normal school week will assess the ability of staff to interpret and apply Policy 494 and Regulation 494-1. Audits will primarily be conducted after hours and during periods of low occupancy. Each site will also be reviewed during holiday periods, Code Red, and Code Green closings as well as extended shutdown periods such as the winter break, spring break, and summer vacation.

Computer Power Management

Computer Power Management refers to the mechanism for controlling the power use of personal computer hardware. In Prince William County Schools this is done through globally deployed policy using software to implement and monitor computer energy consumption and cost. An established schedule of machine and monitor sleep settings as well as automated remote shutdown is enforced.

Energy Conservation Savings

July 2012 – December 2016

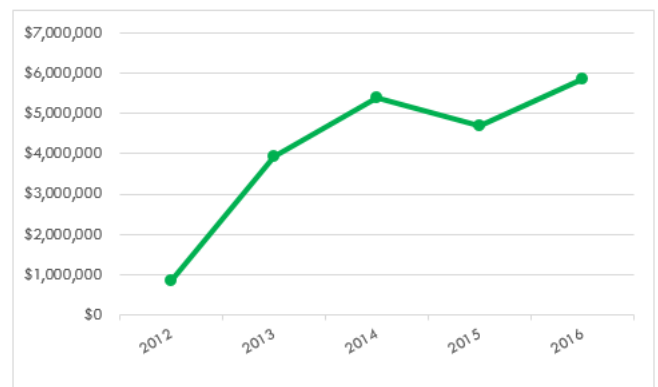
Period	Month	Savings		Period Totals
		\$	%	
Fast Track 2012	July - December	\$851,607	8.50%	\$851,607
Performance 2013	January-December	\$3,944,871	18.50%	\$3,944,871
5th Performance Quarter 2014	January	\$515,593	23.70%	\$1,418,525
	February	\$435,683	21.00%	
	March	\$467,250	24.40%	
6th Performance Quarter 2014	April	\$482,537	26.30%	\$1,202,905
	May	\$367,120	19.70%	
	June	\$353,248	18.60%	
7th Performance Quarter 2014	July	\$549,008	30.90%	\$1,386,768
	Aug	\$446,344	24.00%	
	September	\$391,416	19.60%	
8th Performance Quarter 2014	October	\$392,422	21.40%	\$1,384,285
	November	\$457,923	23.10%	
	December	\$533,941	24.90%	
9th Performance Quarter 2015	January	\$409,434	18.70%	\$961,749
	February	\$176,598	7.70%	
	March	\$375,717	18.60%	
10th Performance Quarter 2015	April	\$363,878	19.10%	\$1,009,267
	May	\$326,641	16.00%	
	June	\$318,748	15.80%	
11th Performance Quarter 2015	July	\$515,005	26.30%	\$1,309,498
	August	\$421,569	21.10%	
	September	\$372,924	17.30%	
12th Performance Quarter 2015	October	\$441,737	22.20%	\$1,408,163
	November	\$452,570	22.80%	
	December	\$513,856	26.20%	
13th Performance Quarter 2016	January	\$571,339	24.20%	\$1,544,888
	February	\$422,292	20.60%	
	March	\$551,257	28.80%	
14th Performance Quarter 2016	April	\$407,200	21.80%	\$1,371,821
	May	\$460,635	23.00%	
	June	\$503,986	25.40%	
15th Performance Quarter 2016	July	\$608,469	31.30%	\$1,422,666
	August	\$443,762	20.60%	
	September	\$370,434	16.80%	
16th Performance Quarter 2016	October	\$456,139	22.60%	\$1,505,826
	November	\$549,770	27.00%	
	December	\$499,916	22.80%	
Total Program Savings		\$20,722,837	19.90%	

Cenergistic, Inc.

In June 2012, PWCS entered into a shared savings contract with Cenergistic, Inc. to generate savings based on behavioral changes and operational strategic planning. The contractor has assisted with staffing recommendations, EnergyCAP software integration, and program methodology. The term of this contract is five years and will expire in FY2018. Savings shared through this agreement are compared to a baseline of utility expenses from the 2011-2012 school year. PWCS retains 65% of the savings attributable to this program.

Annual Energy Conservation Savings

July 2012 – December 2016



Facility Occupancy Scheduling

Facility use and scheduling is a critical component of energy management in PWCS. Each facility is assessed for its occupancy and use patterns in order to identify periods of inactivity and low usage. Mechanical systems are then programmed through automated building control systems to reduce mechanical operation and therefore energy consumption during periods of low usage. Schedules are reviewed regularly with site based administrators and adjusted for seasonal patterns and system performance. School locations conducting events scheduled before or after normal school hours are required to enter these activities into “FacilityDirect” software. Per Regulation 494-1, “Energy Conservation”, HVAC settings will revert to those designated for an unoccupied state after hours, during weekends and on holidays. If heating or air conditioning is needed for a scheduled activity, staff is required to check the HVAC box to indicate as such in the request. Failure to do so will result in no available HVAC service. Events are entered no later than a week in advance, so that the service can be scheduled in a timely manner.

Education

Sustainability Coordinators

Sustainability is the dedicated effort of an organization, working together, to reduce the use of finite resources. By evaluating everything from the materials used in the construction of our new schools and renovations, to enhanced storm water management, sustainable purchasing, energy efficiency and environmental literacy in the classroom, we as a group can decrease the negative impact our activities have on our world, starting today.

The role of a Sustainability Coordinator is not an intense one, but it is very important. Sustainability Coordinators function as ambassadors on behalf of the Energy Management division, conveying our collective message of environmental leadership to each individual site. Each coordinator will be encouraged to create opportunities for discussions about sustainability and energy conservation. The Office of Facilities Services will provide tools for the development of a sustainable culture within each school. Volunteers requiring recertification points could potentially earn up to 5 hours for participation as a site based Sustainability Coordinator.

Project Learning Tree

The Office of Facilities Services incorporates education into the overall strategic plan for the School Division. Energy Management staff support the development and implementation of GreenSchools! modules that focus on Energy, Water, Waste and Recycling, and Environmental Quality. Modules are registered with the Office of Student Learning and the Professional Learning Catalog under SCI 706. Participants requiring recertification points receive 5 hours for participation in the annual training workshop.

GreenSchools! investigations bolster science, technology, engineering, and math (STEM) education while promoting sustainable schools. They provide students with opportunities to actively engage in scientific inquiry as they solve real-world environmental issues at their school. PLT GreenSchools! is a program of the American Forest Foundation, in partnership with the 50-state PLT network, the U.S. Forest Service, the Corporation for National and Community Service, and many other national, state, and local partners.

Go Green Va.!

The Go Green Va.! program is sponsored by the Virginia School Board Association. The program requires annual documentation and planning for issues relating to environmental stewardship, energy management,

indoor air quality and education of students in the classroom regarding sustainable strategies. PWCS has participated since 2009 earning both the Certified Green School Division award and the Silver Green School certification. This year PWCS was awarded the Platinum Green Schools Division certification and recognized as an overall Green Schools Challenge winner.

Energy Infrastructure Improvements

Energy Infrastructure Fund

The PWCS Capital Improvements Program (CIP) calls for a portion of the anticipated energy conservation savings to be directed towards continued investment in infrastructure improvements capable of generating additional savings and greater efficiency. Utilizing Energy Infrastructure Improvement funding allocated in the CIP creates sustainable facility improvements that serve a wide range of priorities within the Office of Facilities Services while creating measureable Return on Investment (ROI).

The Energy Management division has endeavored to work with a variety of stakeholders from throughout the School Division to identify priorities.

Applicable infrastructure improvements include:

- Conversion of heating systems from fuel oil to natural gas to reduce point of use cost.
- Building management control system installation, upgrades and modernization.
- Lighting control systems.
- Lifecycle modernization/replacement of inefficient and poorly performing mechanical systems.
- Building envelope improvements for better insulated entry points, windows and exterior cladding.
- Sustainability focused enhancements designed to maximize educational opportunities derived directly from school facility sites (e.g. activity trails, ecological studies, civil engineering/ land survey training, renewable energy).

Anticipated Energy Infrastructure Funding Priorities Fiscal Years 2018-2022

Energy Infrastructure Improvement Project	Fiscal Year				
	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>
Building Automation Improvements	\$150,000	\$150,000	\$150,000	\$250,000	\$250,000
Boiler Fuel Conversions	\$200,000	\$200,000	\$200,000		
Lighting Control Systems	\$150,000	\$150,000	\$50,000	\$50,000	\$50,000
Mechanical Infrastructure (Supplemental Heating, Cooling, Dehumidification)	\$300,000	\$300,000	\$400,000	\$500,000	\$500,000
Building Envelope/Thermal Insulation	\$200,000	\$200,000	\$100,000	\$100,000	\$100,000
Third-Party Energy Audits			\$100,000	\$100,000	\$100,000
TOTAL	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000

Energy Infrastructure Improvement Projects Fiscal Years 2017 and 2018

FY 2017	
Location	Project Scope
All Sites	Expand Interval and Demand Management Program to enable more real time data analysis
Parkside Middle School	Convert Hybrid BAS to Siemens.
Mountain View Elementary	Replace Domestic Hot Water Heaters and Boilers Complete Natural Gas Installation
Stonewall Middle	Exterior Lighting Replacement
Hampton, Graham Park, Fred Lynn, Neabsco, Potomac High School, Potomac Middle School, Rippon Middle School	Gym Lighting Upgrades - \$82,500
Division-Wide	Boiler Maintenance Program
Division-Wide	PC Power Management
Division-Wide	Third-Party Energy Audits

FY 2018	
Location	Project Scope
All Sites	Expand Interval and Demand Management Program to enable more real time data analysis
Osborn Park High School	Replace Boilers
Stonewall High School	Replace Water Heater and Expansion Tank
Freedom High School, Battlefield High School, Forest Park High School, Potomac View Elementary	Auditorium and Gym Lighting Upgrades
Division-Wide	Boiler Maintenance Program
Division-Wide	PC Power Management
Division-Wide	Third-Party Energy Audits

Performance Contracting

PWCS has endeavored to utilize all available tools at our disposal in our efforts to reduce facility operating costs. Executive Order 48, issued by the Governor of Virginia in 2008, created a contract that all state and public bodies may use for the assessment and improvement of energy consuming infrastructure. This arrangement aids in the reduction of lengthy competition as the contractors on the approved contract have been pre-qualified at the state level. Performance Contracting is specifically appropriate for aiding jurisdictions in lifecycle cost analysis and payback analysis. These two formulary tools are used in the study of a construction projects' anticipated financial performance. Performance Contractors can thereby propose to provide financing on behalf of Owners by allocating future savings toward the cost of the project.

New Construction

The Office of Facilities Services is committed to the construction of energy efficient, highly performing facilities. Energy Management team members regularly review all energy consuming systems during the design and development of any building construction, renovation or alteration.

The Administrative Coordinator, Energy Management provides final coordination with the Supervisor of Construction for energy management related specifications and construction details.

The Energy Management Division is committed to year-round advocacy for conservation efforts in PWCS.

Utilities

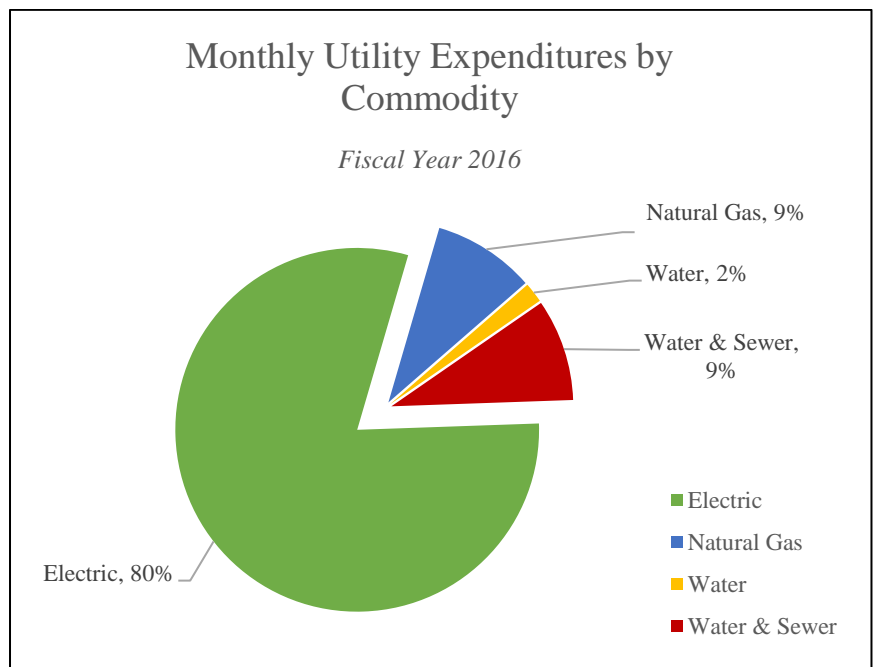
Account Management

Regulation 494-2 establishes responsibilities and operating procedures for the management of utilities by the Office of Facilities Services. It is the responsibility of staff to provide operating utilities and technical services supporting the proper maintenance and operation of school facilities. All utility invoices are processed using customized software called "EnergyCap". The Administrative Coordinator, Energy Management functions as the liaison for third party contracts and utilities provided by private corporations and companies.

Utilities covered by this provision include:

- Heating Fuels
- Electrical Services
- Water and Sewer Services
- Motorized Fuels

Utility bill data for all PWCS sites is now available for access by the public through the PWCS Energy Management website.



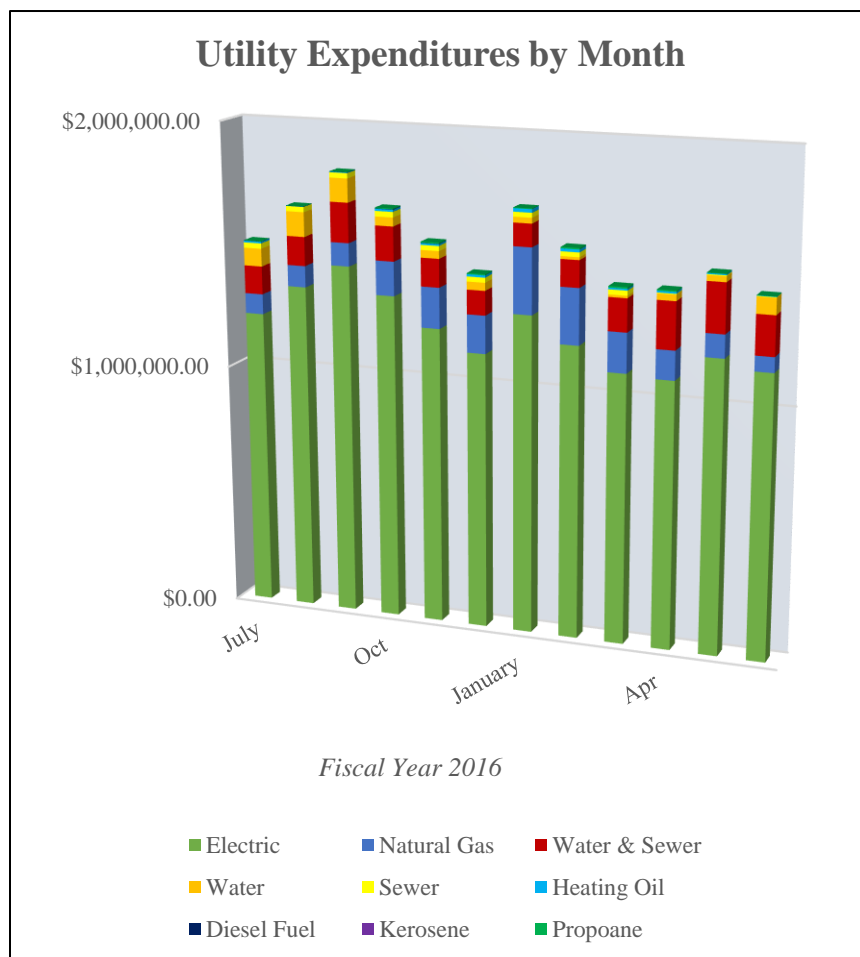
Environmental Compliance

Prior to procurement, delivery or payment of any heating and/or motorized fuels, the Administrative Coordinator, Energy Management ensures coordination with the Administrative Coordinator, Environmental Services, to verify proper delivery techniques, inspect spill control methods, and verify quantity delivered.

Demand Limiting

Due to the constraints of available electrical utility capacity and required demand, it has become essential for utility providers at times to control the distribution of electricity. Demand limiting engages customers to reduce their personal or corporate consumption when possible, during critical times, so as not to overload the electrical grid. Utilities sub-contract the administration of demand limiting programs. Enrollment in such programs means utility customers may be notified of a critical period and subsequently, voluntarily, curtail usage where possible. A rebate is provided based on the extent of curtailment pursued. These peak periods are generally during the summer.

Over summer break, demand limiting presents a great opportunity for Prince William County Schools to pursue the benefits of demand limiting as a potential revenue source. Our facilities currently operate on a reduced schedule during these times.



APPENDIX F

Technology Improvements Program

Future Ready Technology Improvement Plan

2018-2022

INFRASTRUCTURE

To Support Everywhere, All the Time Learning



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Notes: 1. All Plan Overviews and Objectives are based on the FY 2016 Budgeting for Results Plan.
2. FY 2017 current year expenses are shaded in gray on all charts and are included for reference.

Plan Overview: Data Center/School Upgrades/Replacements

This section includes information in regard to the operational, technical, and functional support of the Enterprise Data Centers, backup/restore services, disaster recovery services, and authentication services.

Plan Objectives

Through the PWCS Technology Improvement Plan, data center systems, servers, and backups need to be replaced, refreshed, and maintained on a regular technology improvement plan schedule. This equipment is critical in maintaining and supporting core infrastructure and ensures instructional and business systems are able to access the data and resources needed to support teaching and learning and to perform other critical functions and/or provide data/communications to stakeholders.

The plan will meet the following objectives:

- Replace backup infrastructure to not over exceed capacity.
- Upgrade network infrastructure in the data center on a regular maintenance schedule of five years.
- Upgrade the disaster recovery plan and develop a strategy that includes evaluating the effectiveness of using Independent Hill Complex (IHC) as a disaster recovery site.
- Maintain some physical servers and replace every five years for applications not supported in a virtualized environment.
- To make more efficient use of hardware and environmental resources, invest and maintain virtualization annually.
- Replace the core storage area networks (SANs) at the Kelly Leadership Center (KLC), and (IHC) due to reaching capacity.
- Replace fiber channel switches for the SAN connectivity which have reached end-of-life.

See detailed chart on the following page.

Data Center/School Upgrades/Replacements – listed in order of priority						
	FY 17	FY18	FY19	FY20	FY21	FY22
Backup System Replacement	\$655,000					
Storage Infrastructure Replacement	\$500,000					
Physical Data Center SQL Servers	\$20,000					
Data Center Networking	\$50,000					
School Server and UPS Replacement				\$600,000		
Server Virtualization		\$150,000	\$75,000	\$75,000	\$75,000	\$250,000
Disaster Recovery		\$35,000				
Total	\$1,225,000	\$185,000	\$75,000	\$675,000	\$75,000	\$250,000

Plan Overview: VoIP/LAN/WLAN and Bandwidth Upgrades

This section includes information in regard to the installation, management, and operational support for the PWCS I-Net wide area network (WAN) including the local area networks (LANs), and wireless area networks (WLANs) throughout the School Division.

Plan Objectives

Through the PWCS Technology Improvement Plan, Network Services provides bandwidth and VoIP/LAN/WLAN upgrades Divisionwide. Locations are upgraded based on the end-of-life of their current phone system and in correlation, when possible, with PWCS facilities renovations and additions.

The plan will meet the following objectives:

- Increase bandwidth to meet Federal ConnectEd initiative and the Virginia Department of Education (VDOE) and Education Superhighway recommendations of 1 Mbps per student by 2018.
- Upgrade network infrastructure (Local Area Network, Wireless Local Area Network, and VoIP) Divisionwide.
 - ✓ Schools;
 - ✓ Trailers; and
 - ✓ Central office and other related facilities.

**Notes: 1. This will have an associated increase in internet service provider fees of \$720,000 annually.*

2. Ongoing assessments could increase the bandwidth upgrade estimate by \$500,000+.

VoIP/LAN/WLAN School Upgrades and Replacements – listed in order of priority						
	FY 17	FY18	FY19	FY20	FY21	FY22
Bandwidth Increase to 10gb		\$1,500,000*				
Voice and Data Network Upgrade	\$2,747,041	\$2,199,481	\$1,086,505	\$1,165,900	\$1,180,400	\$1,605,000
Network Switching Infrastructure Upgrades	\$419,948	\$419,948	\$419,948	\$419,948	\$419,948	\$419,948
Total	\$3,166,989	\$4,119,429	\$1,506,453	\$1,585,848	\$1,600,348	\$2,024,948

Plan Scope

Tentative LAN, WLAN, and VoIP Upgrades Schedule

The charts below provide a tentative schedule over the next five years of locations to be upgraded. The VoIP telephone replacement sequence is based on the age of existing equipment in each facility and coordinated with renovations and new construction.

Note: Light-blue-shaded boxes in the charts indicate service upgrades that still need to be completed.

2017-18 School Year (FY18)			
School	LAN	WLAN	VoIP
Buckland Mills ES			\$45,000
Dumfries ES	\$60,000	\$50,000	
Kerrydale ES			\$45,000
Marshall ES	\$60,000	\$50,000	
Minnieville ES	\$60,000	\$50,000	\$45,000
Occoquan ES	\$60,000		\$45,000
Swans Creek ES	\$60,000	\$50,000	\$45,000
Tyler ES	\$60,000	\$50,000	
Yorkshire ES	\$60,000	\$50,000	
Bull Run MS			\$65,000
Potomac MS			\$65,000
Forest Park HS		\$95,000	
New Alternative School	\$118,000	\$95,000	\$118,000
Remaining Trailers Divisionwide		\$278,481	
Total	538,000	\$768,481	\$473,000
Grand Total	\$1,779,481		

E-Rate Schools Carried Over from 2016-17 School Year (FY17)			
School	LAN	WLAN	VoIP
Henderson ES	\$60,000	\$50,000	
McAuliffe ES	\$60,000	\$50,000	\$45,000
Westridge ES	\$60,000	\$50,000	\$45,000
Total	\$180,000	\$150,000	\$90,000
Grand Total	\$420,000		

2018-19 School Year (FY19)			
School	LAN	WLAN	VoIP
Henderson ES		\$50,000	
Loch Lomond ES	\$60,000	\$50,000	
Mary Williams ES	\$60,000	\$50,000	\$45,000
Penn ES	\$60,000	\$50,000	\$45,000
Rockledge ES	\$60,000	\$50,000	\$45,000
Sinclair ES	\$60,000	\$50,000	\$45,000
Vaughan ES	\$60,000	\$50,000	\$45,000
West Gate ES		\$50,000	
Westridge ES		\$50,000	
Woodbine Preschool	\$6,505	\$25,000	\$20,000
WAN Core Switch Upgrades			
Edward Kelly Leadership Center		\$50,000	
Independent Hill Complex		\$30,000	
Osborn Park HS		\$40,000	
Total	\$366,505	\$475,000	\$245,000
Grand Total		\$1,086,505	

2019-20 School Year (FY20)			
School	LAN	WLAN	VoIP
Alvey ES	\$60,000	\$50,000	\$45,000
Ashland ES	\$60,000	\$50,000	\$45,000
Bel Air ES	\$60,000	\$50,000	\$45,000
Belmont ES		\$50,000	
Bennett ES	\$60,000	\$50,000	\$45,000
Coles ES	\$60,000	\$50,000	\$45,000
Dale City ES	\$60,000	\$50,000	\$45,000
Featherstone ES		\$50,000	
King ES		\$50,000	
Piney Branch ES	\$60,000	\$45,000	\$45,000
Rosa Parks ES	\$60,000	\$50,000	\$45,000
Ellis ES	\$60,000		\$45,000
Porter Traditional	\$60,000		
Beville MS		\$75,000	
Total	\$600,000	\$620,000	\$405,000
Grand Total	\$1,625,000		

2020-21 School Year (FY21)			
School	LAN	WLAN	VoIP
Leesylvania ES	\$60,000	\$50,000	\$45,000
Marshall ES			\$45,000
McAuliffe ES		\$50,000	
Marumsc Hills ES	\$60,000	\$50,000	\$45,000
Montclair ES	\$60,000	\$50,000	\$45,000
Mullen ES		\$50,000	
Neabsco ES		\$50,000	
River Oaks ES	\$60,000	\$50,000	\$45,000
Triangle ES	\$60,000	\$50,000	
Porter Traditional		\$50,000	\$45,000
New Dominion	\$20,000	\$65,400	\$10,000
Fred Lynn MS			\$65,000
Total	\$315,000	\$505,400	\$345,000
Grand Total	\$1,165,900		

2021-22 School Year (FY22)			
School	LAN	WLAN	VoIP
Bristow Run ES	\$60,000	\$50,000	\$45,000
Buckland Mills ES			\$45,000
Cedar Point ES	\$60,000	\$50,000	\$45,000
Enterprise ES	\$60,000	\$50,000	\$45,000
Fannie Fitzgerald ES	\$60,000	\$50,000	
Glenkirk ES	\$60,000	\$50,000	
Samuel Gravely ES	\$60,000	\$50,000	
Signal Hill ES	\$60,000	\$50,000	\$45,000
Springwoods ES		\$50,000	
T. Clay Wood ES	\$60,000	\$50,000	
Victory ES	\$60,000	\$50,000	\$45,000
Pennington Traditional	\$60,000	\$50,000	\$45,000
Bull Run MS			\$65,000
Rippon MS		\$75,000	
Total	\$600,000	\$625,000	\$380,000
Grand Total	\$1,605,000		

Completed Upgrades – as March 28, 2017			
School	LAN	WLAN	VoIP
Antietam ES	X	X	
Buckland Mills ES	X	X	
Chris Yung ES	X	X	X
Dumfries ES			X
Ellis ES		X	
Featherstone ES	X		X
Fitzgerald ES			X
Glenkirk ES			X
Gravely ES			X
Haymarket ES	X		X
Henderson ES			X
Kilby ES	X	X	X
King ES	X		X
Kyle Wilson ES	X	X	X
Lake Ridge ES	X	X	X
Loch Lomond			X
The Nokesville School	X	X	X
Occoquan ES		X	
Old Bridge ES	X	X	X
Pattie ES			X
Piney Branch ES			X
Potomac View ES	X	X	X
Springwoods ES	X		X
T. Clay Wood ES			X
Triangle ES			X
Tyler ES			X
Williams ES		X	
Yorkshire ES			X
Benton MS	X	X	X
Beville MS	X		X
Bull Run MS	X	X	
Fred Lynn MS		X	
Gainesville MS	X	X	X
Godwin MS	X	X	X
Graham Park MS	X	X	X

Completed Upgrades – as of March 28, 2017			
Marsteller MS	X	X	X
Parkside MS	X	X	X
Porter Traditonal	X	X	X
Potomac MS	X	X	
Rippon MS	X		X
Stonewall MS	X	X	X
Woodbridge MS	X	X	X
Battlefield HS	X	X	X
Brentsville HS	X	X	X
Colgan HS	X	X	X
Forest Park HS	X		X
Freedom HS	X	X	X
Garfield HS	X	X	X
Hylton HS	X	X	X
Osborn Park HS	X	X	X
Patriot HS	X	X	X
Potomac HS	X	X	X
Stonewall Jackson HS	X	X	X
Woodbridge HS	X	X	X
PACE East			X
PACE West			X
EKLC	X	X	X
IHC	X	X	X
Transportation East			X
Transportation West			X
Transportation Central			X
Transportation Hooe Rd			X
Totals	40	37	54

Plan Overview: Network/Infrastructure/Replacements

This section includes information in regard to information security operations to provide confidentiality, integrity, and availability for all PWCS network and computer system assets. Information Security Services supports the design, implementation, management, and maintenance of all information security solutions Divisionwide to identify and prioritize security risks.

Plan Objectives

Through the PWCS Technology Improvement Plan, Information Security Services provides firewalls, intrusion prevention systems, DNS, email/spam filtering, forward/reverse proxies, content filtering, malware and patch management, auditing, and security management.

The plan will meet the following objectives:

- Provide for enterprise wireless management, network system identification, access control, and segmentation.
- Meet future ready bandwidth requirements and replace end-of-life hardware with additional firewall, VPN, and intrusion prevention.
- Incident and event correlation solution to log and capture event data through SIEM.
- Decrypt encrypted network traffic and actively pass traffic to proxy, firewalls, and intrusion prevention systems.
- Analyze network traffic including spam, websites, and executables in a protected environment and detonate payloads in real-time to ensure malicious content does not get downstream to critical systems.

Network/Infrastructure Upgrades/Replacements – listed in order of priority						
	FY 17	FY18	FY19	FY20	FY21	FY22
802.1x Network Access Control, System Profiling		\$600,000				
Divisionwide Enterprise Class Forward Proxies Application Compliance	\$756,000	\$702,000		\$702,000		\$702,000
Divisionwide Enterprise Class Perimeter and Datacenter Firewalls, VPN	\$36,000	\$365,000		\$365,000		

Network/Infrastructure Upgrades/Replacements – listed in order of priority						
Divisionwide Enterprise Cloud Based SIEM Incident and Event Correlation Solution			\$561,751		\$561,751	
Network Encryption Tap Appliance	\$148,000	\$148,000		\$148,000		
Spam and Network Traffic Sandboxing		\$240,000			\$240,000	
Total	\$940,000	\$2,055,000	\$561,751	\$1,215,000	\$801,751	\$702,000

Note: The TIP has been modified to reflect the results of the FY 2016 internal audit.

Plan Overview: Student Information System Replacement

This section includes information in regard to operational, technical, and functional support for all Student Information applications within the School Division. The Student Information Systems Office provides technical support for data analysis reporting, development, maintenance, and implementation of the coming new student information system.

Plan Objectives

Through the PWCS Technology Improvement Plan, the Student Information Systems Office will replace PowerSchool student information system due to end-of-life. The new system will include a student information system, teacher gradebook, parent portal, learning management system, and integration with special education software and data warehouse.

The plan will meet the following objectives:

- Replace the current end-of-life student information system.
- To consolidate or integrate where applicable, the various School Division information subsystems to allow for a comprehensive management of all the programs.

Student Information System – listed in order of priority						
	FY 17	FY18	FY19	FY20	FY21	FY22
Student Information System (once purchased ongoing costs will be part of the ITS operation budget)		\$6,400,000*				
Total		\$6,400,000*				

**Notes: 1. A potential increase estimated at \$2 million could affect the project total based on the RFP results and decisions on the consolidation/integration of subsystems in a variety of departments.*

2. While not reflected in the TIP, there is an overtime and project manager cost estimated at \$400,000.

Plan Overview: Refresh

This section includes information that will outline the age-based refresh cycle for technology devices in PWCS along with associated costs over the next five years.

Plan Objectives

The PWCS age-based technology refresh is not intended to replace all equipment, serve as the sole funding source for technology equipment, or drive instructional and operational goals. Instead, the age-based refresh is one avenue to equip students, teachers, administrators, and support staff, with the needed tools to support the Strategic Plan by integrating technology into instruction and business operations.

Included in the Refresh Plan

Across the School Division there is a variety of technology in classrooms. For the scope of this refresh plan, we are including Division-standard equipment and replacing it based on the age of each asset across the School Division, some dating back to 2004. Therefore, refresh funds will not be equally divided between schools. Instead, to get the School Division on an “even playing field,” available funds will be expended where the oldest computers and related equipment are located. Information Technology Services notifies schools of the age of all their technology equipment, the plan’s schedule to replace/update it over a five-year period, and options within 50/50 matches (when offered/available) to refresh the remaining equipment. This provides schools with the information needed to fiscally plan for their participation in 50/50 match opportunities.

The following equipment is included in the refresh plan:

- All “Red Tag” non-Windows 7 or higher capable computers in the School Division;
- Desktops;
- Laptops;
- Servers; and
- Storage Area Networks (SANS) and will assess and implement cloud storage when appropriate.

Fully-Funded Computer/Server Refresh						
	FY 17	FY18	FY19	FY20	FY21	FY22
Information Systems Equipment	\$1,276,141	\$722,000	\$20,000	\$722,000	\$20,000	\$1,222,000
Schools/Offices	\$6,858,535	\$2,967,609	\$7,711,783	\$4,092,225	\$4,817,973	\$4,830,488
Total	\$8,134,676	\$3,689,609	\$7,731,783	\$4,814,225	\$4,837,973	\$6,052,488

Note: Current plan does not include a refresh for all technology equipment (e.g., interactive whiteboards, printers, tablets), estimated to cost an additional \$2,000,000+ annually.

Snapshot of the Refresh with Projected VPSA Funding and 50/50 Match						
	FY 17	FY18	FY19	FY20	FY21	FY22
Information Systems Equipment	\$1,276,141	\$722,000	\$20,000	\$722,000	\$20,000	\$1,222,000
School 50/50	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000
ITS 50/50	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000
Straight Refresh Funding for Schools	\$711,859	\$1,266,000	\$1,968,000	\$1,266,000	\$1,968,000	\$766,000
Total	\$2,688,000	\$2,688,000	\$2,688,000	\$2,688,000	\$2,688,000	2,688,000

Snapshot of the Projected Cost Differential in Funded vs. Fully-Funded						
	FY 17	FY18	FY19	FY20	FY21	FY22
Fully Funded Refresh	\$8,134,676	\$3,689,609	\$7,731,783	\$4,814,225	\$4,837,973	\$6,052,488
VPSA Only Funded Refresh	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000	2,338,000
Difference	-\$5,796,676	-\$1,351,609	-\$5393,783	-\$2,476,225	-\$2,499,973	-\$3,714,488

TIP Summary

Plan Implementation Costs Overall

Comprehensive TIP						
	FY 17	FY18	FY19	FY20	FY21	FY22
Data Center/School Upgrades/Replacements	\$1,225,000	\$185,000	\$75,000	\$675,000	\$75,000	\$250,000
VoIP/LAN/WLAN School Upgrades and Replacements	\$3,166,989	\$4,119,429	\$1,506,453	\$1,165,900	\$1,600,348	\$2,024,948
Network/Infrastructure Upgrades/Replacements	\$940,000	\$2,055,000	\$561,751	\$1,215,000	\$801,751	\$702,000
Student Information System (once purchased, ongoing costs will be part of the ITS operating budget)		\$6,400,000				
Computer Refresh (additional funding would be needed if fully-funded)	\$6,858,535	\$2,967,609	\$7,711,783	\$4,092,225	\$4,817,973	\$4,830,488
Projected Estimated Totals	\$12,190,524	\$15,727,038	\$9,854,987	\$7,148,125	\$7,295,072	\$7,807,436

- When revenue is insufficient to cover expenses, items in the age-based computer refresh will be delayed until future years, unless 50/50 school matching funds (when offered/available) exceeds expectations.
- The non-fully-funded equipment would cost an additional \$3.5 million (on average) annually (e.g. \$1.3 million for interactive whiteboards, tablets, and printers and \$2 million for computers).

Projected Local, State and Federal Revenue

Projected Revenue						
	FY 17	FY18	FY19	FY20	FY21	FY22
PWCS Five-Year Budget Plan	\$2,500,000	\$10,900,000	\$3,500,000	\$4,000,000	\$4,500,000	\$5,000,000
Federal E-Rate Type I*	\$353,933	-	-	-	-	-
Federal E-Rate, Type II Modernization*	\$1,831,733	\$1,881,889	\$504,903	\$732,000	\$492,240	\$735,000
50/50 Computer Refresh (Revenue from Schools)	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000
VPSA State Technology Incentive Program*	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000
Local Cable Franchise Fees*	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
LOCAL, STATE, AND FEDERAL TOTALS	\$7,573,666	\$15,669,889	\$6,892,903	\$7,620,000	\$7,880,240	\$8,623,000
PROJECTED REVENUE (+/-) VS. PLAN IMPLEMENTATION	-\$4,616,858	-\$57,149	-\$2,962,084	\$471,875	\$585,168	\$815,564

- *Notes: 1. These revenue sources have restrictions on the technology and services that can be purchased.
 2. These revenue sources do not include year-end funding that has supplemented the TIP over recent years.
 3. Includes one time funding to addressing the critical unmet need for increased bandwidth (\$1.5 million) that meets the Federal ConnectEd initiative and the Virginia Department of Education (VDOE) and Education Superhighway recommendations of 1 Mbps per student by 2018; and to replace the vendor end-of-life student information system (\$6.4 million).